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JANUARY, 1958

# Construction Methods AND EQUIPMENT

A M C G R A W - H I L L P U B L I C A T I O N



At Connecticut's Quinnipiac River Bridge, stiffleg derricks hoist the first of four 89-ton girders to close the gap on the 387-ft main span, the country's longest plate-girder span.

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One of Horner Construction Co. cranes on the new U.S. Air Force Academy job. It's rigged with  $\frac{5}{8}$ " 6x19 Yellow Strand Wire Rope.



**Horner Construction Co.  
uses extra high strength  
"POWERSTEEL"  
on Air Force Academy  
access bridge construction**

A. S. Horner Construction Co. of Denver has the contract for access highway bridges at the new Air Force Academy near Colorado Springs.

They chose Yellow Strand Wire Rope on their cranes and "carrying towers."

The heavy loads on the crane shown above were easily handled with  $\frac{5}{8}$ " 6x19 Yellow Strand "POWERSTEEL"—the extra high strength, extra long life wire rope. Truck winches pulling the towers were equipped with regular Yellow Strand.

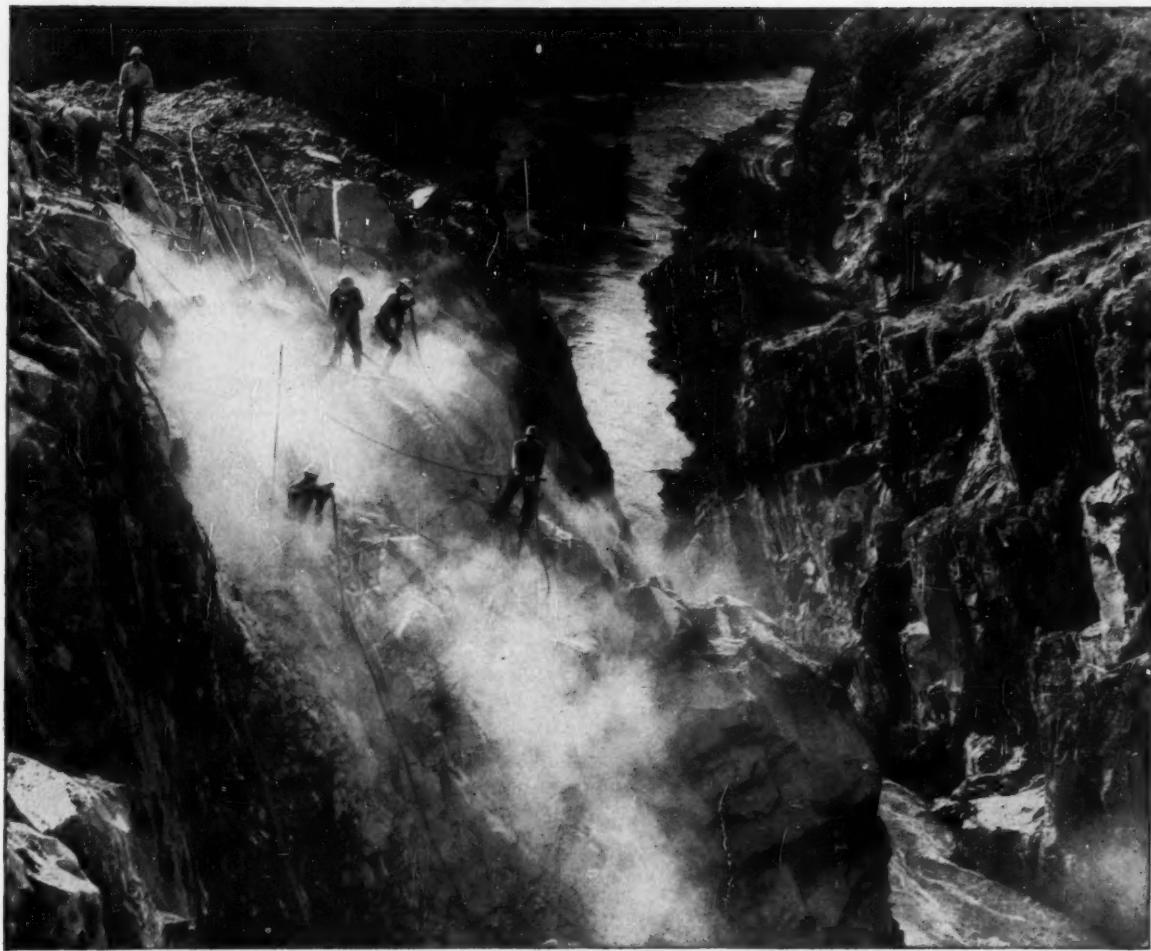
A unique feature of the job was the handling of 100-foot, 100-ton prestressed concrete beams. "Carrying towers," riding steel rails, transported the heavy beams into position. The huge concrete forms were supported with Yellow Strand Slings. Horner Construction Co. has been a steady Yellow Strand user for ten years.

You can count on the extra life and dependable service from Yellow Strand Wire Rope. Your B & B distributor is well qualified to recommend the best rope for the job. See him soon. Broderick & Bascom Rope Co., 4203 Union Blvd., St. Louis 15, Mo.

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**Wire Rope**



# B.F.Goodrich report:



## Men punch holes in rock to blow up a cliff

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**Problem:** Those workmen are drilling holes for dynamite charges, to blast out rock for a dam. It's no cinch to lug a heavy drill down a cliff like that. Too many times it had to be promptly carried up again—the tool had choked to death.

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**What was done:** B.F.Goodrich engineers went to work on the problem. By adding, subtracting, changing proportions of rubber, they found a special

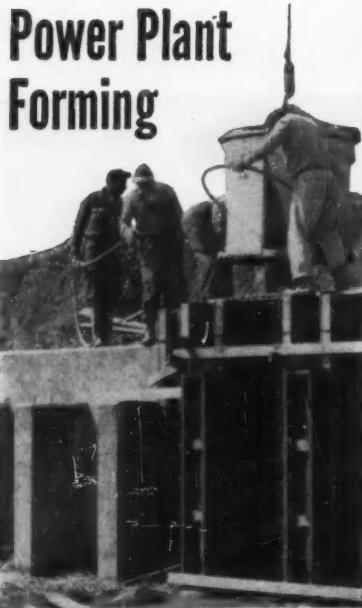
compound that stands hot air, won't harden, crack, or break into gummy particles to clog tools.

**Savings:** Hose lined with this new rubber was made and put to work. On jobs where air hose used to go to pieces in weeks, B.F.Goodrich hose lasts months, even years. The nuisance of clogged tools was ended permanently.

**Extra benefits:** Resistance to heat is only one of the improvements made in this B.F.Goodrich air hose. It has a cover so rugged that dragging over rough rock won't tear it. And it's light, flexible, easy to work with.

**Where to buy:** Your B.F.Goodrich distributor has exact specifications for the B.F.Goodrich air hose described here. And, as a factory-trained specialist in rubber products, he can answer your questions about all the rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Co., Dept. M-246, Akron 18, Ohio.*

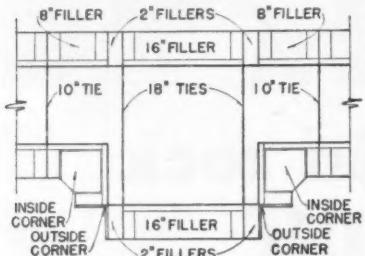
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# Construction Methods AND EQUIPMENT

JANUARY, 1958

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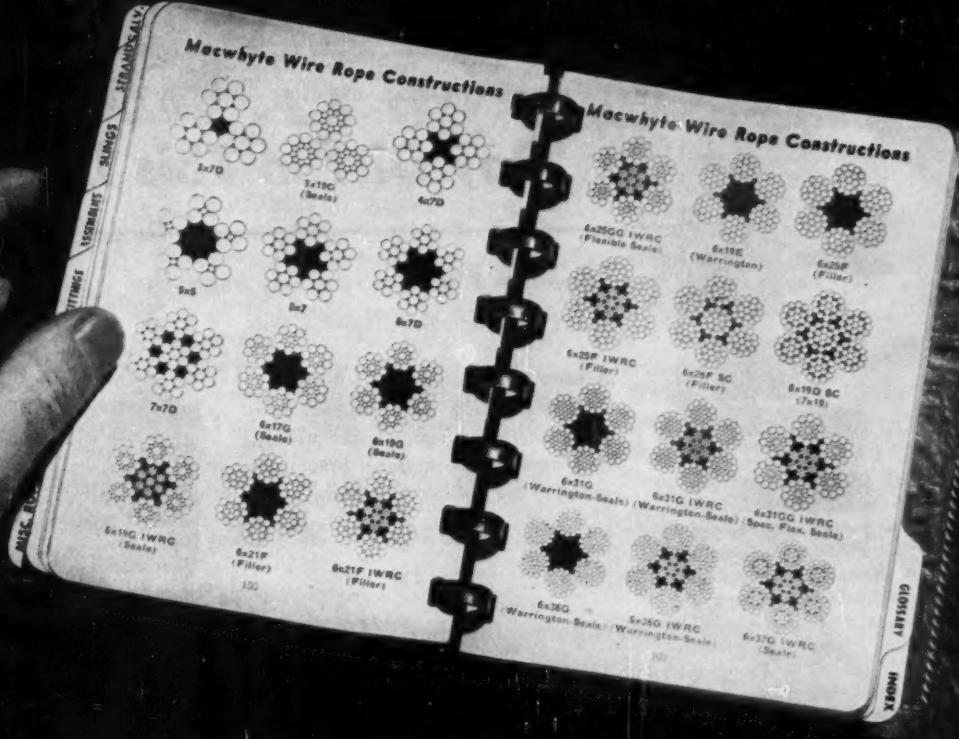
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JANUARY, 1958

## Pay Dirt in This Issue

### Curved Wall Cofferdam

Makes Excavation Easy . . . 56

A 60-ft deep cofferdam, with a clear interior working area, resulted when a contractor who didn't like working in a maze of conventional bracing decided to try a different technique.



### Pipemobile Hauls, Places Heavy Pipe Sections . . . . 63

An ingenious rig called a Pipemobile is placing some of the heaviest precast concrete pipe sections in construction history to bring the Colorado River Aqueduct up to its full capacity.



### ON THE COVER

Two 115-ton derrick travelers close the gap on Connecticut's new Quinnipiac River Bridge, the country's longest plate-girder bridge span. Closure girders 108 ft long are hoisted one at a time into 387-ft span. Previous record holders were the 375-ft spans of the Passaic and Hackensack River bridges on the New Jersey Turnpike. Bethlehem Steel Co. is erection contractor.

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### NEXT MONTH

To put up six bridges at the U.S. Air Force Academy near Colorado Springs, Colo., A. S. Horner Construction Co. of Denver cast 128 heavy prestressed girders at the site and erected them with a method that made use of temporary steel trusses and gantries.

### Scrapers Dig Heavy Clay For Wing Embankments . 110

They need tractor help to load, but a fleet of single and twin-engine scrapers moving core material for wing embankments of the Noxon Rapids Dam are keeping the job right on schedule.



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# THESE PORTABLE PUMPS PRIME AT 30 FEET LIFT!



PUMP AT REST

Captured liquid retained for priming. Note absence of the usual check valve.



PRIMING ACTION

Entrained air (B) escapes at (A) to be discharged. Priming liquid returns (C) to entrain more air.



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Straight-in suction voids entrance restrictions. Water enters direct to the eye of the impeller.

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Eagle, 3", 18,000 GPH, 6.8 HP.*

You saw them at the Road Show. Buy them now at your Gorman-Rupp Distributor.



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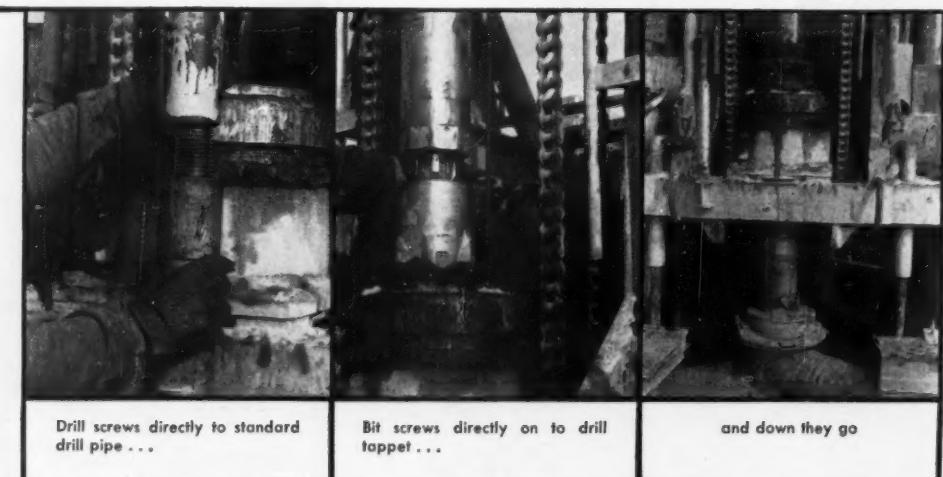
### Two sizes available—here are the condensed specifications

	diameter	length	weight	recommended bit size
Model AM6	5 3/4"	38.6	200 lb.	6 1/2"
Model AM4	4"	35.6	98 lb.	4 3/4"

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Bit screws directly on to drill  
tappet . . .

and down they go



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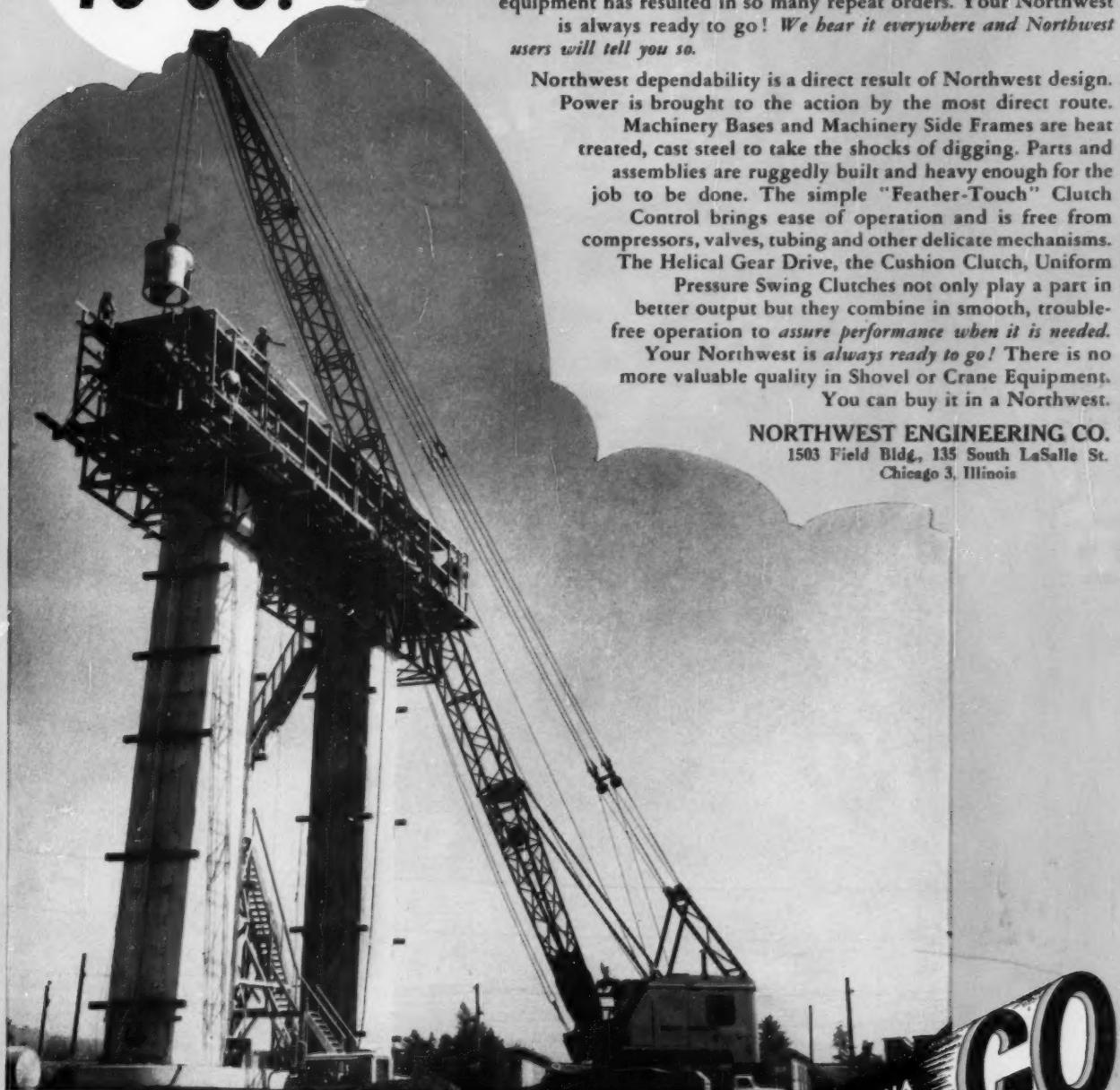
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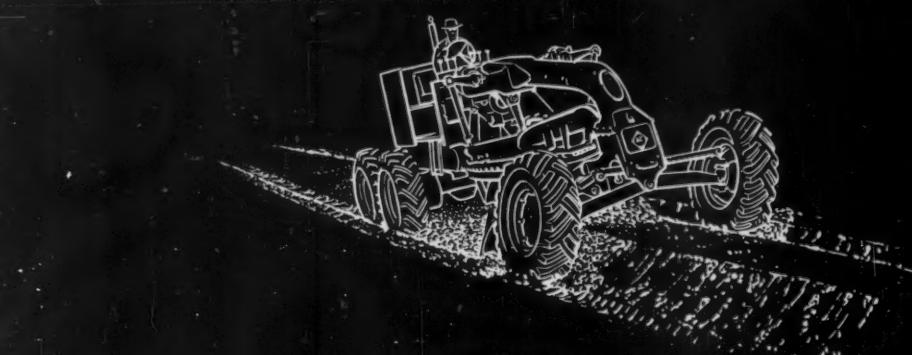
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TEXACO LUBRICATION ENGINEER R. H. Trimmer reviews lube problems with Supt. G. L. Laughton who credits Texaco Simplified Lubrication Plan with cutting maintenance costs and keeping big mining job on schedule.



# never removed the pan"

"The Texaco Simplified Lubrication Plan keeps maintenance costs down, keeps the job on schedule," reports George L. Laughton, Supt. of Isbell Construction Company's Three Kids Mine project.

Isbell Construction Company is doing strip mining on contract with Manganese, Inc., Henderson, Nevada. They are using a Texaco Simplified Lubrication Plan for this project, and it is piling up some outstanding records.

"As of January 17, the truck shown in the picture had operated 7,714 hours using *Texaco Ursa Heavy Duty SAE 40* exclusively, and it's never had the pan removed," reports Superintendent George L. Laughton. "We also use *Texaco Crater 2X Fluid* for wire rope, *Texaco Gear Lube HD* for transmissions, *Texaco Marfak* and *Texaco Marfak Heavy Duty*, for chassis and wheel bearings. We are entirely satisfied with Texaco lubricants," says Mr. Laughton, "and we have never had a failure due to lubrication."

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Page 12 — CONSTRUCTION METHODS and Equipment — January 1958

Three of a fleet of ten Yuba Movalls stripping coal overburden at Huntley, New Zealand. These 32-ton capacity units are powered by AC T-360 prime movers.



**LOADING** — The big target, big capacity body carries its load low, maintaining high ground clearance since frame and body are integral and compact.



**DUMPING** — Level body offers no gravity resistance, with potential 140,000 lb. ejector push assuring complete positive discharge with minimum use of power.



**EMPTY** — Sides and bottom are scraped clean, eliminating need for "mucking out" or decreasing capacity for next full load. Complete ejection takes only 11 to 14 seconds.

MA-802

YUBA CONSOLIDATED INDUSTRIES, INC.

# **Construction News From Washington**

**Washington, D.C.  
January, 1958**

## **Teamsters and the Building Trades**

Expulsion of the International Brotherhood of Teamsters from the merged AFL-CIO won't break Teamster ties with the construction unions. The Teamsters were members of the AFL-CIO's Building Trades Department while they were in the AFL-CIO. But AFL-CIO President George Meany isn't trying to force a split between the Building Trades and the Teamsters; they can maintain their close contacts outside AFL-CIO headquarters. This includes continuation of the four-union pact in heavy construction—among Teamsters, Operating Engineers, Laborers, and Carpenters.

The truce is temporary, however. It may last only until the fate of Teamster president-elect Jimmy Hoffa is determined in the courts. The AFL-CIO wants the Teamsters back, but only if Hoffa doesn't hold a top job.

If Hoffa holds on to the job, there's a good chance that the AFL-CIO and the Teamsters will begin scrapping again. If the AFL-CIO should charter another trucking union, the battle might rage far and wide, and construction would inevitably suffer.

The long-standing jurisdictional row between the Building Trades and the industrial unions of the AFL-CIO also hinges, in part, on the Teamsters. Right now, it's a status quo situation with neither side making formal moves to settle disputed rights over industrial construction. It will flare up again if the Teamsters and the AFL-CIO break their truce.

## **Freeze on Water Resources Projects**

There's a freeze on calls for construction bids for federal water resources projects. Construction agencies were instructed in early December to stop contract awards and to issue no bid calls until the Administration has completed work on the fiscal 1959 budget that goes to Congress this month.

Money cuts are planned to help pay for increased spending on missiles and other defense activities. A number of new construction starts already scheduled will be postponed if Administration plans go through. But Congress is likely to have entirely different ideas on that score.

Even if Congress votes money for projects that the White House proposes to postpone, the delay in calling for bids will set back construction starts as much as a year. Two big jobs in the upper Colorado River basin are threatened—the 492-ft-high concrete arch dam and powerplant of the \$83-million Flaming Gorge Project and the 27,000,000-yd earth dam on the \$37-million Navajo Project.

Flaming Gorge and Navajo Dams are not to be put up for bids within the next month as scheduled. The Administration decided to cut funds for these jobs out of its 1959 budget. Starting money was

appropriated last year for the two dams, but the cutoff of continuing funds for fiscal 1959 means that prime contracts for construction cannot be awarded now.

### **Will Congress Step In?**

Unless Congress reverses the President by approving funds for water resource projects, starts will be delayed at least two years. If appropriations come through by next summer despite White House opposition, bid calls cannot be expected before the end of 1958.

The restrictions also are hobbling contract awards for the flood control and rivers and harbors projects of the Corps of Engineers. Army Engineers have been under instructions to issue no invitations to bid on any contract until their civil works programs are realigned in conformity with Administration budget cuts for fiscal 1959. Legislative leaders on Capitol Hill understand that the Budget Bureau aims for a spending reduction of 20% below 1958. This slash calls for dropping many planned construction contracts.

How long the freeze will last depends first on Congress. The legislators will settle that question by August in their appropriation bills. If a defense emergency should exist, the President even then could impose a moratorium on spending for projects that he considers non-essential or deferrable. But he would not use that power merely to hold federal expenditures under a spending ceiling.

### **Lease-Purchase Again**

Lease-Purchase projects got a fresh breath of life last month. General Services Administration accepted financing bids for five jobs costing \$22 million. These bids came in on the first round of openings following removal of the old 4% limit on interest rates. Two insurance companies offered financing for the five buildings at rates from 4.74 to 5%.

Construction bids on the five jobs this month and next will determine the success of the new effort to revive the lease-purchase program. GSA advertised for construction offers to be opened at the agency's regional offices on the following dates: Jan. 22 for an Albuquerque, N. M., project where the maximum investment is \$5.8 million; Jan. 28 for Council Bluffs, Ia., \$1.7 million; Jan. 31 for Kansas City, Kan., \$2.1 million; Feb. 14 for Burlington, Ia., \$1.2 million; and Feb. 18 for Atlanta, Ga., \$11.5 million.

Some 38 projects in all are ready to go out for lease-purchase bids by investors and construction contractors if the program goes ahead as GSA hopes. Five projects failed to pull any financing offers on the first go-around. The agency immediately readvertised these projects and also asked for investment bids on additional new projects. A total of 98 projects costing nearly \$700 million have been approved for the program by Congress. All these eventually will be advertised if contractors' bids on the early projects show that they can build them within the fixed cost limits.

# Road contractor's 6-Payhauler® fleet outhauls competitive rigs...up to 2-to-1!



"When we pulled a '65' Payhauler unit off the stockpile for another job, two of our other off-highway trucks were needed to replace it," reports Supt. Virgil Rice, for Cage Brothers, San Antonio, Texas. This Payhauler trio is running circles around other outfits, on a 12-mile road-rebuilding project near Snyder, Texas!

**Prove the get-away surge**, and up to 25% faster haul speed of an International Payhauler—the result of bonus turbo-charged diesel power; road-matched and load-matched gear choice; and the power-cushioning leverage of planetary drive axles.

Try Payhauler "pick-up truck" spotting ease. Exclusive high reverse, "zip-around" power steering, and grade-beating power get the credit! See how 12-second dumping with double-acting hydraulic hoist speeds the cycle. Measure the effect of Payhauler operating ease, and downgrade safety, for example, of positive Torqmatic braking! See your International Construction Equipment Distributor for a demonstration!



"I'm just sorry all our haulers aren't International Payhauler units," adds Supt. E. R. Rice. "They haul bigger loads, faster; give less trouble; and operators like them better than our other new haul units." This Mr. Rice rides herd on another Cage Brothers' 3-unit Payhauler team—setting a fast tonnage pace, hauling limestone for highway resurfacing, near Abilene.



## International® Construction Equipment

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.



International Harvester Co.  
180 N. Michigan, Chicago 1, Ill.

Gentlemen:

I am a contractor.  Am interested in becoming a contractor.  Am an equipment operator (please check square that applies). Send me Payhauler Catalog (CR-603-G).

Name \_\_\_\_\_

Street Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_



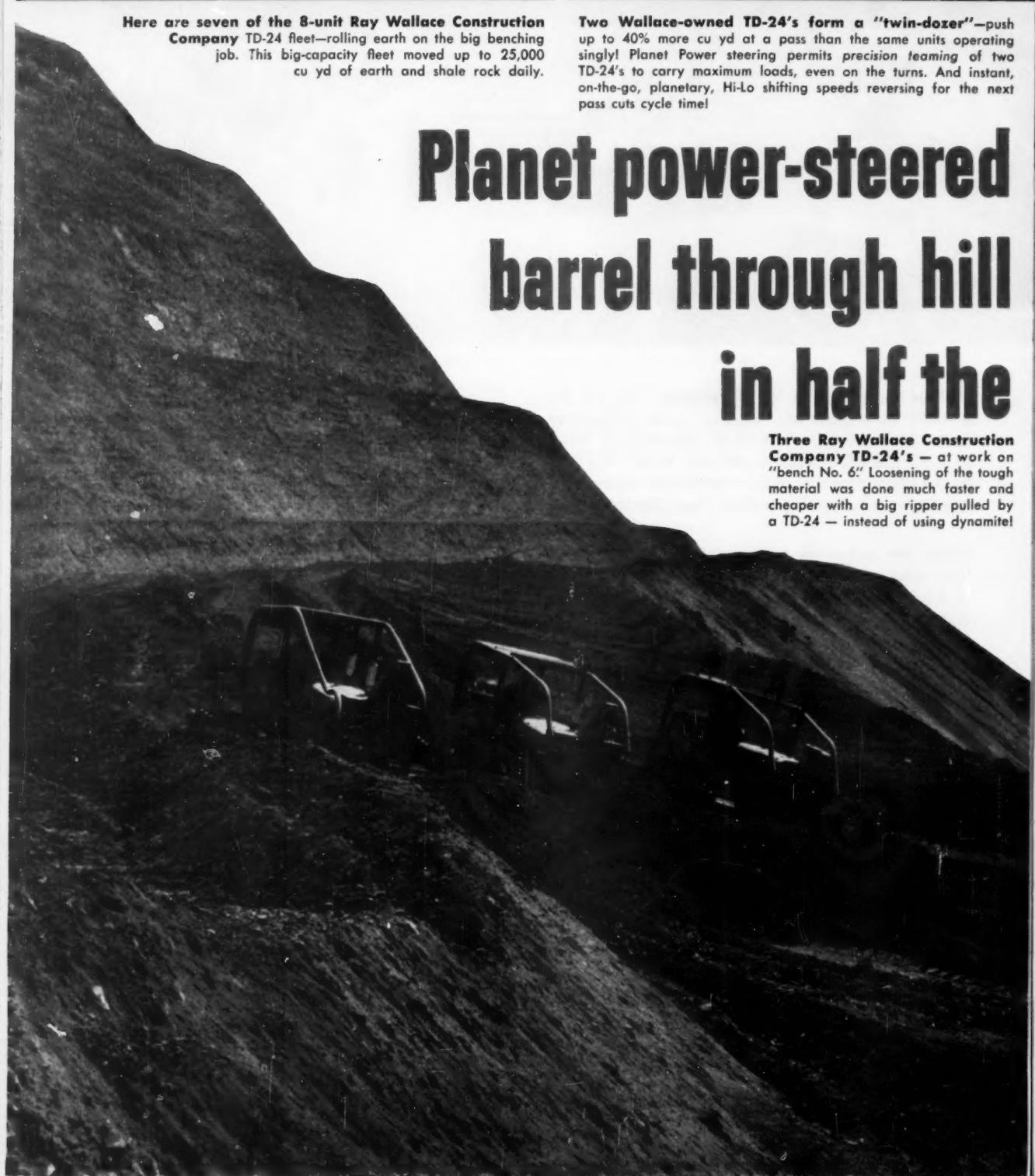
Here are seven of the 8-unit Ray Wallace Construction Company TD-24 fleet—rolling earth on the big benching job. This big-capacity fleet moved up to 25,000 cu yd of earth and shale rock daily.



Two Wallace-owned TD-24's form a "twin-dozer"—push up to 40% more cu yd at a pass than the same units operating singly! Planet Power steering permits precision teaming of two TD-24's to carry maximum loads, even on the turns. And instant, on-the-go, planetary, Hi-Lo shifting speeds reversing for the next pass cuts cycle time!

# Planet power-steered barrel through hill in half the

Three Ray Wallace Construction Company TD-24's — at work on "bench No. 6." Loosening of the tough material was done much faster and cheaper with a big ripper pulled by a TD-24 — instead of using dynamite!





# TD-24's benching job estimated time

Here's how pairs of TD-24's were enabled by exclusive Planet Power-steering and Hi-Lo shifting to operate as precision teams. They massed their combined 400-hp plus, and formed a huge U-blade that moved a gigantic yardage per push. The extra yardage equalled a "dirt-dividend" of up to 40%—compared to two dozers, operating singly!

"When I get bigger and tougher jobs, I just get more International TD-24's," states contractor Ray Wallace. "In a tight road-building schedule, our first TD-24 cleared its purchase price in only 28 days; was first overhauled at 8,700 hours. None of our equipment has lost time here, and we've cut the engineer's estimate in half! You can't get better performance than this!"

How International power exclusives give you a new basis for getting and fulfilling profitable contracts!

A series of seven huge benches had to be carved around this 350-foot-high hill—to rid California Rt. 1 of a dangerous slide area, near Rockdale.

Each self-draining bench is 50' high, and 20' wide on top. 800,000 cu yd (25% earth, 75% shale rock) had to be moved, primarily in curved "passes."

Ray L. Wallace Construction Co., Westport, California, won the contract by basing his bid on Planet Power-steered TD-24 performance and its proven ability to move and "hold" bonus yardage loads on turns as well as straight-aways! And his eight TD-24's did the job in only half the time the engineer estimated!

#### The difference: BIG TD-24 power exclusives

TD-24 power exclusives can often help you "run power circles" around conventionally steered, and geared king-sized crawlers!

Proven Planet Power steering, for example, eliminates "dead track drag" on the turns—gives full-time "live" power on both tracks while turning—enables the TD-24 to pull or push as big a load on the turns as on the straight-aways. Extra yards per pass mean bigger bonus yardage per day!

Cycle-speeding, TD-24 Hi-Lo shifting permits instant, on-the-go speed-changing—to faster or slower, either in forward or reverse. Instant speed adjustment to the load without stopping takes full-time advantage of full power! And planetary Hi-Lo shifting speeds up TD-24 shuttle-dozer cycle time—increases the number of passes per hour; thus increases TD-24 capacity!

See for yourself how these and other International TD-24 power exclusives arm you with a new, job-getting, profit-building basis for getting and fulfilling contracts. Ask your International Construction Equipment Distributor for a TD-24 demonstration!



**International®  
Construction  
Equipment**

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.



## **Another road-builder proves: ...4-in-1 four-machine utility can replace a flock of other equipment!**

**On a \$270,000 street improvement project, Salt Lake City contractor, R. C. Bradshaw Construction Co. has proved you can replace several other machines—with one International Drott 4-In-1!**

One minute, their TD-14 4-In-1 is a boulder-bucking, earth-rolling, tree-grubbing bulldozer. Next instant, it's a 2 1/4-cu yd Skid-Shovel, out-digging a back-hoe—and out-loading 'em all!

Move the machine-selector lever again—and the 4-In-1 is a "carry-type scraper" that does finish grading with inch-close accuracy. And fingertip easy, you get 4-In-1 clamshell action for fast clean-up, bank-shaping, ditch-digging, or stock-pile loading!

Or at a hydraulic command, the 4-In-1's scarifier

attachment can be ripping asphalt or hard soil.

Exclusive pry-action break-out puts the 4-In-1 on tough jobs where less powerful diggers don't belong. Exclusive ground-level roll-back and exclusive parallelogram raise action make another "heap of difference" in favor of 4-In-1! And shock-swallowing Hydro-Spring gives the 4-In-1 performance protection no other make has!

**Why buy-up and tie-up a flock of limited-duty equipment that one 4-In-1 can profitably replace? Yes, and with one perked-up operator giving you versatility unlimited! Send for a 4-In-1 catalog—see your International Drott Distributor for a 4-In-1 demonstration!**



Send for  
free  
catalog  
today

Gentlemen: I am interested in facts on the 4-In-1 for use in:

Road-building    Producing aggregates  
 Soil conservation    Home and industrial construction

Please send 4-In-1 catalog literature checked:

1-yd TD-6    1 1/2-yd TD-9    2 1/4-yd TD-14    3-yd TD-18  
(CR-640-H)   (CR-627-H)   (CR-635-H)   (CR-632-H)

Name \_\_\_\_\_

Street or R.F.D. \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

International Harvester Company, Chicago 1, Illinois  
Drott Manufacturing Corp., Milwaukee 15, Wisconsin



**INTERNATIONAL<sup>®</sup>**  
**DROTT<sup>®</sup>**

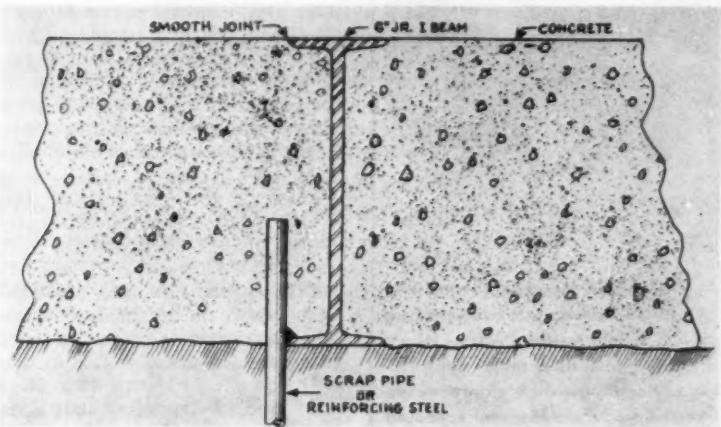
## Job Talk . . .



### Roller Chain Skids Move Big Girders

Roller-chain skids solved the problem of transporting 30-ton prestressed girders from a casting yard to an overpass job at Washington, D. C. Humphreys & Harding, Inc. ruled out cranes to move the units 100 yd to the site. In-

stead, they mounted the beams on wood blocks, which in turn were each placed on Multiton skids. A truck hauled the girders to the job, where they were hoisted on to piers by crane and anchored into position.



### Steel Beam Becomes Expansion Joint

The idea of using a lightweight steel beam as an expansion joint between concrete paving sections is offered by R. G. LeTourneau, noted construction equipment manufacturer.

LeTourneau has devised an unusual joint made of a 6-in. Junior Beam, a lightweight structural made by Jones & Laughlin Steel

Corp. According to LeTourneau, the beam can be held in position by a steel bar driven into the ground and tack-welded to the flange. Adjoining slabs are keyed together so that there is no chance of differential settlement. It also permits the concrete to shrink without exposing an open space.

*continued on next page*

## When our job needs STEEL-SHEET PILING...



**we RENT IT and GET IT**



...our only cost is a low, fixed expense, chargeable directly to work in progress... and we don't tie up capital in inventory stocks.

One call to Foster gets us the exact lengths and exact sections of steel-sheet piling our jobs need. Foster's complete warehouse and field stocks assure prompt shipments—"on time" deliveries that keep our work on schedule.



**"FASTER FROM FOSTER"**

Complete Contractor Service  
Piling • Pipe • Highway Products  
Write for Piling Catalog CM-1

**L.B. FOSTER CO.**

PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4  
ATLANTA 8 • HOUSTON 2 • LOS ANGELES 5



# New HYSTER Space-Saver<sup>®</sup> LIFT TRUCKS

are Powered by CONTINENTAL



New series includes  
6000 (illustrated),  
7000 and 8000-lb.  
capacity models.

Outstanding specialists in two fields have teamed their engineering and production experience to power this new series with a customized engine built specifically for lift truck service. Functionally designed by Henry Dreyfuss, with operator comfort and convenience as a major consideration, the new lift trucks combine ease of handling with high productive capacity and long life. Like so much of the modern equipment speeding the world's work today, they offer that extra assurance of lasting satisfaction, engineered-to-the-job Continental Red Seal power.

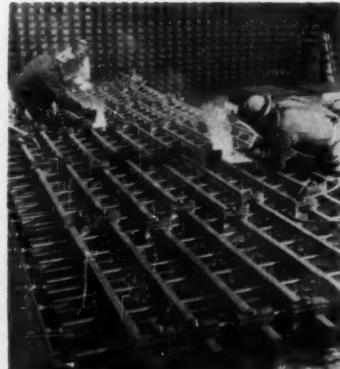
ANY EQUIPMENT IS BETTER EQUIPMENT  
WITH

DEPENDABLE  
CONTINENTAL  
POWER

*Continental Motors  
Corporation*

MUSKEGON • MICHIGAN

## JOB TALK . . . continued



### Steel Deck Tops New Orleans Bridge

A new type of bridge flooring fabricated by the Blaw-Knox Co. of Pittsburgh will deck the new \$65-million Mississippi River Bridge now under construction at New Orleans, La.

Some 126,000 sq ft of decking will be used to sub-surface a 2,428-ft over-the-water section of the bridge and its approaches. Bethlehem Steel Co. is erecting the superstructure.

The decking is made from Modified I-beams, dumbbell members, and corrugated sheets. All material was specially rolled for the job. The I-beams serve as longitudinal bearing beams. They are 5 in. high with a 1-in. flange on the top and a 1½-in. flange on the bottom. Crossbars are lengths of material which have the cross-sectional appearance of dumbbells. They are 2¾ in. high.

Most of the grating for the bridge is being assembled in panels which are 26 ft long, 7½ ft wide, and 5 in. deep. The 26-ft width is just half the curb-to-curb width of the bridge which will accommodate up to five lanes of traffic. Normally the bridge will be operated with two 24-ft lanes and a 4-ft median strip. The median strip can be removed for a fifth lane.

In making up the panels, the bearing beams are placed on 9-in. centers. The crossbars are inserted through the I-beams at irregular 8 and 9-in. intervals. All of the grating is surfaced with a corrugated sheet to retain the asphaltic concrete surfacing.

Crossbars and bearing beams are welded at each point of in-

*continued on page 22*

# Here's NEW Performance...NEW Dependability!

## Unmatched quality at low cost... any way you figure it!



**X** MULTIPLIES Production. The new 10-ton Bucyrus-Erie 11-B crane-excavator is a real go-getter! It's fast between jobs, fast on the job . . . operates as rapidly as a man can handle it.

**-** SUBTRACTS Servicing and Maintenance Time. Clutches and brakes are easily reached. Unit or bench assemblies in main machinery permit quick servicing, easy replacement. All gears are enclosed and run in oil, except the swing pinion and gear. Nylon pins and bushings in the control linkage need no lubrication. Ball bearing swing circle provides low friction, high load bearing capacity, low maintenance and minimum play.

**+** ADDS to Work Time, Profits. Fast between-job travel speeds mean more time working. Strong construction throughout the chassis, main machinery and front end means maximum on-the-job time, too. Extra output ability plus extra work time adds up to extra profits.

**÷** Lets You DIVIDE Your Time Between More Jobs. The 11-B combines rubber-tired mobility with maneuverability to handle a variety of scattered jobs. Main machinery arrangement simplifies conversion to hoe, crane, shovel, dragline, or clamshell for added versatility.

451E5BC

**BUCYRUS  
ERIE**

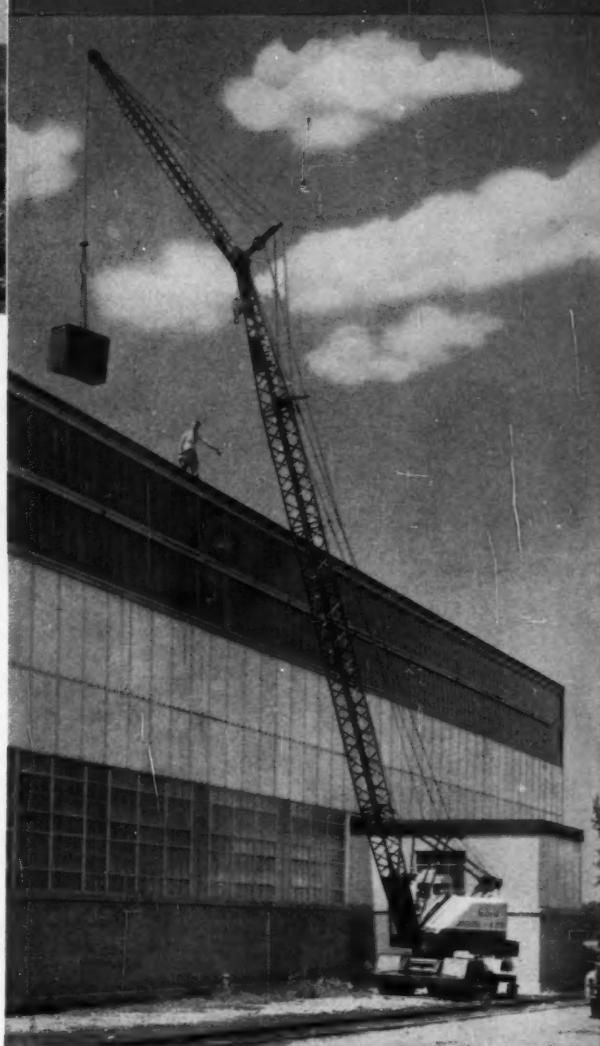
*A Familiar Sign at the Scene of Progress*

BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WISCONSIN

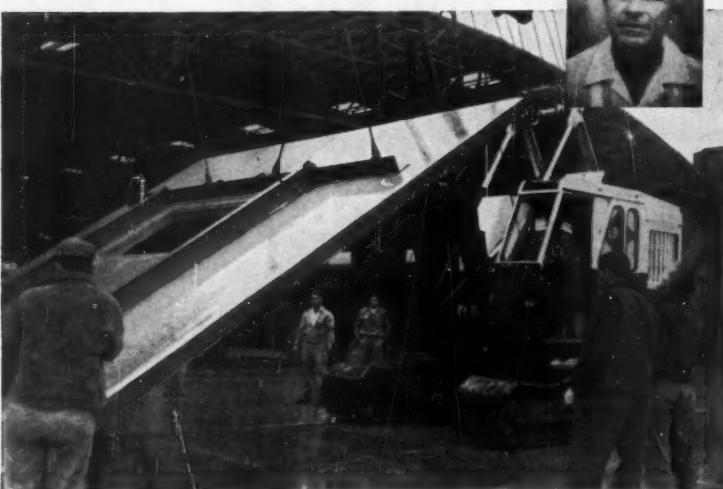
**Check It  
NOW**

. . . at your nearby Bucyrus-Erie distributor or write us direct. Ask for all the facts and figures on these cost-cutting profit-makers. Invest confidently in this fast-moving, hard-working, easy-to-maintain mobile crane-excavator.

**ALL NEW  
11-B Transit Machine**



F. E. Stedke reports:  
 "We have used Richmond Spiders  
 on numerous jobs with very good results,  
 both from a standpoint of utility and service."

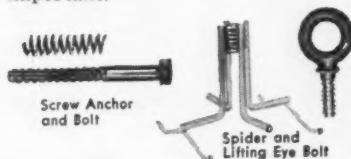


Lifting 15-ton pre-cast wall unit in construction of Neon Products Building. 1" double Richmond Spiders were used. Stedke Construction Co., Lima, Ohio; contractors.

## Pre-casting & Lifting Concrete Slabs

### Richmond Spiders contribute speed and safety

Contractors recognize that tilt-up construction using thin, pre-cast slabs offers substantial economies for certain types of buildings—when properly used. The method, originally developed in the Far West for earthquake resistance, has spread rapidly across the country. In employing it, selecting and placing the slab-lifting inserts, to ensure that the load is carried and distributed correctly, is extremely important.



Since, for example, the slab-lifting inserts near the top of the slab carry virtually the total load when the initial pick-up is made, severe impact and handling loads in both tension and shear develop in them. A substantial safety factor is a must—and that means extra strong, reliable insert units, and a conservative load application.

With its Spider Anchors, especially designed for pick-up and placement of thin slab sections, Richmond recommends that at least 50 per cent impact be added to the dead load to establish a working load. A 2:1 safety factor should be maintained in the relation of this working load to the established ultimate strength

of the anchorage units in the concrete. Equally important, the anchorage units should not be figured at full strength until the concrete of the slab has reached a minimum compressive strength of 3,000 lbs. p.s.i.

Tests have shown that the actual tensile strength of Richmond Spiders is far greater than Richmond's recommended maximum working load—a margin of safety that gives you added assurance of a fast, economical job. There are Richmond Slab Anchors especially designed for anchoring blocks and fixtures to the floor slab for bracing slabs into vertical position; Slotted Lagstuds for setting Spiders so as to permit screed finishing; Square-Head Tylags for anchoring lifting fixtures. Richmond drop-forged steel-lifting Eye Bolts are designed to develop the full strength of the bolts.

The new Richmond Handbook gives complete technical data on these and all other Richmond-engineered tying devices, anchorages and accessories. It will help you to pour concrete better and more economically. It's yours for the asking. Write to RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Ave., Brooklyn 8, N. Y. or 315 South 4th St., St. Joseph, Mo.

### JOB TALK . . . continued

tersection. The corrugated surfacing sheet is welded on the underside to both bearing and cross bar members. This provides the necessary rigidity for the grating panels.

The finished grating weighs 20 lb. per sq ft. With the bituminous mix placed on top of it for vehicular traffic, the load will be 47 lb per sq ft. The grating is designed to Louisiana truck or lane loading specification H20-S16. In all, some 700 panels weighing 1,400 tons are involved in decking the bridge.



### Cover Plates Protect Tires

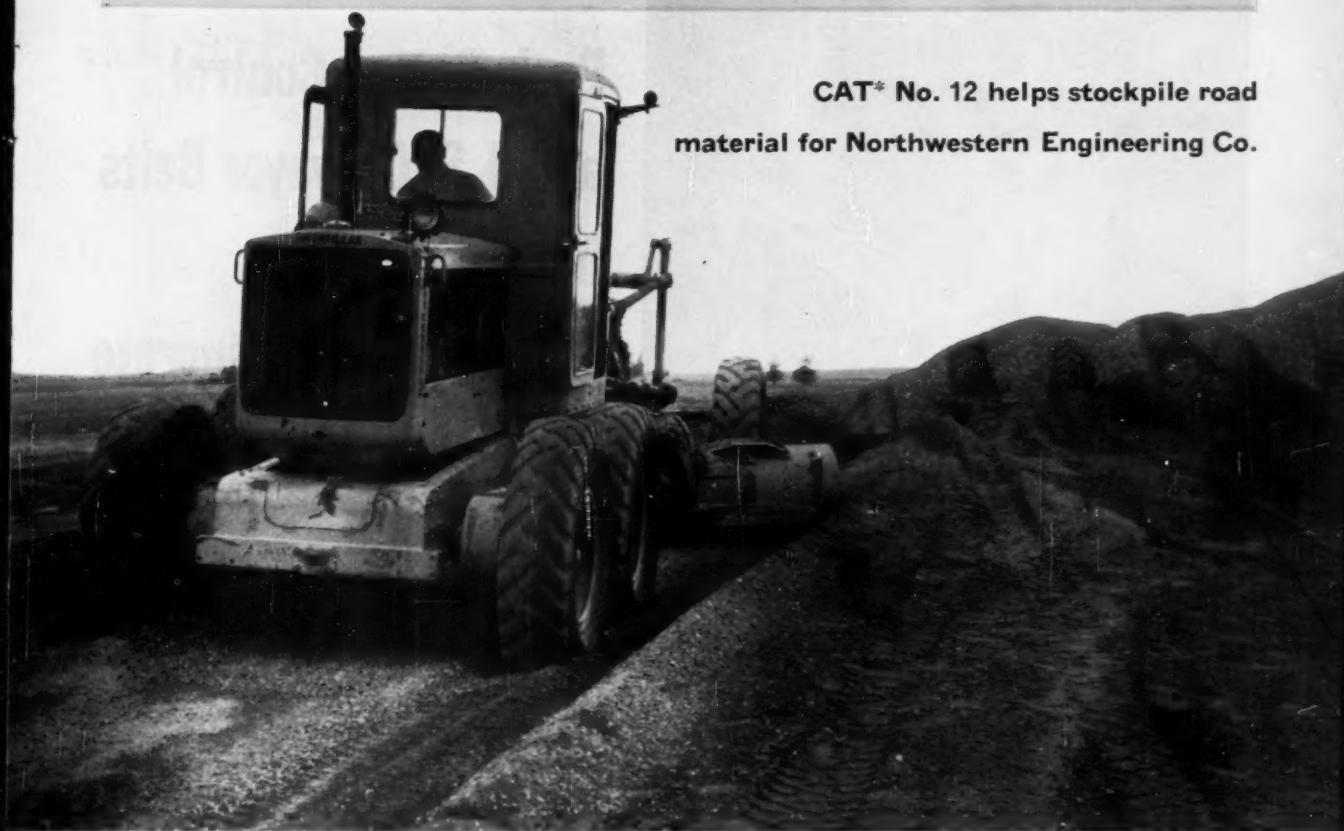
Stones that lodge between the rear tires and the main frame of a wagon can do a lot of damage in a short time. Trapped in the gap when the unit is loaded, they tear the tread and shorten tire life considerably. To solve the problem, Union Building and Construction Co. of Passaic, N.J., welds steel plates over the gap between the tire and body. The plates deflect falling stones, keep the gap clean.

**Join THE MARCH OF DIMES**

**They need YOU!**

OUR RICHMOND  
AND WE ARE IT'S RICHMOND!  
**Richmond**  
SCREW ANCHOR CO., INC.  
816 LIBERTY AVENUE, BROOKLYN 8, N. Y.  
315 SOUTH 4TH ST., ST. JOSEPH, MO.

# TONS OF HOT MIX ON THE MOVE



CAT\* No. 12 helps stockpile road  
material for Northwestern Engineering Co.

This huge stockpile is being readied for the surfacing of 17 miles of road to replace Rt. 212 near Newell, South Dakota. Northwestern Engineering Co. of Rapid City is using a Cat No. 12 Motor Grader and two D8 Tractors to stockpile 110,000 tons of base course material, 36,000 tons of hot mix and 7,000 tons of shoulder material.

You can see that the No. 12 is doing its job. Plenty of power in that husky diesel engine, and plenty of load capacity on the blade. What you *can't* see is the steady-going dependability of the machine.

Caterpillar Motor Graders are ruggedly built to stand up month after month on the hardest jobs—jobs that cause breakdowns in graders of lesser quality. The triple box section frame has ample strength to match engine power, and the box section circle and drawbar assembly give rigid support to the blade. Newly designed front components have the extra strength for long life in tough going.

## Other New Improvements

Other new improvements help keep the No. 12 the standard of the industry. Adjustable seat and bigger cab

with better ventilation and 31% more window area increase operator efficiency; longer frame and tandem assure full utilization of the No. 12's versatility—both with chains and 14.00-24 tires.

Add to these features the excellent visibility from the seat, optional in-cab starting and trouble-free tubeless tires, and you can see why production is high and down time rare.

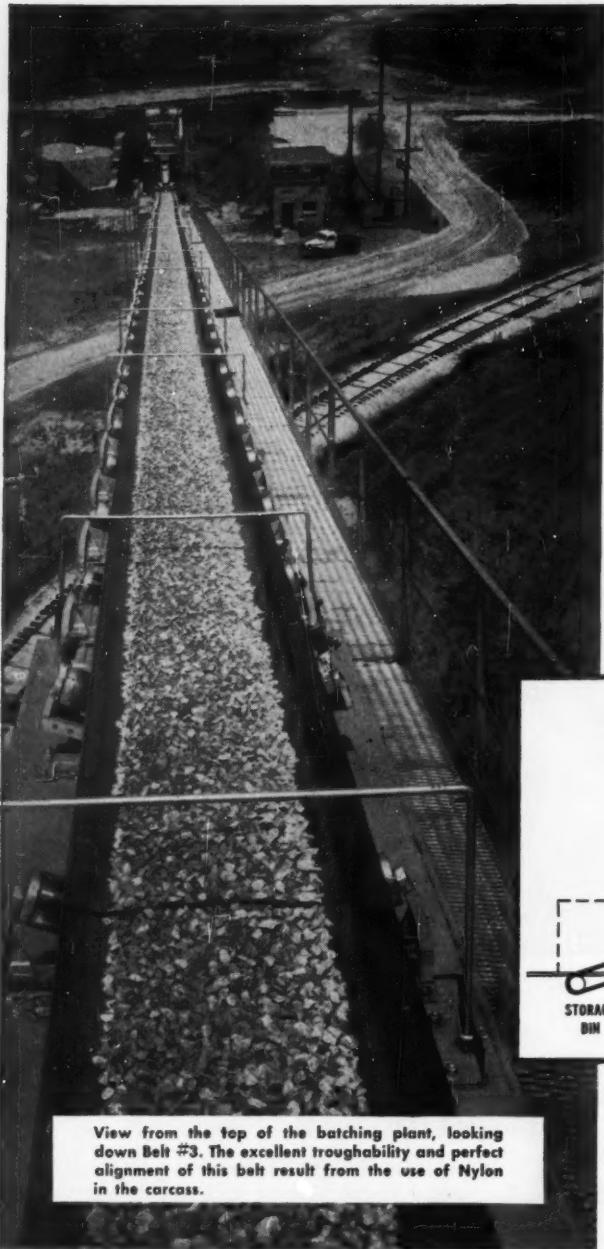
If you're looking for profitable performance with low operating cost, get the complete facts on the No. 12 from your Caterpillar Dealer. He backs the long work life and high resale value of the machines he sells with reliable service and a full stock of Caterpillar parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

# CATERPILLAR\*

\*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

WANTED—  
THE HARD WORK



**View from the top of the batching plant, looking down Belt #3. The excellent troughability and perfect alignment of this belt result from the use of Nylon in the carcass.**

"This is the largest concrete plant\* of its type in the world," says the plant's manager. "In aiming to turn out the best concrete at the lowest possible cost we require a highly mechanized operation."

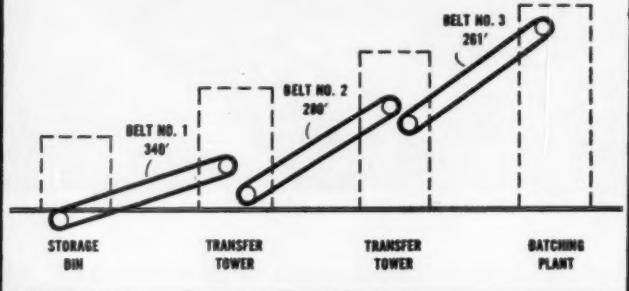
And that's what this plant has. Almost 2,000 feet of U. S. Rubber's 30" wide U. S. Matchless patented Style XN conveyor belting carries raw materials through the reclaiming tunnel, then up a steep grade to a turn head—electrically controlled—and finally discharges the cargo into the always-



**CONVEYOR BELTS**

## **Push-Button Control and U. S. Conveyor Belts help turn out 120 cu. yds. of concrete per hour**

**FLOW CHART OF CONVEYOR BELT SYSTEM.**



hungry jaws of the huge batching plant.

One man in a control tower oversees the entire operation, from storage pits to plant bins. The control board tells him when a bin is getting low. By pressing a button he can start one of the three U. S. Belts hauling sand, stone, or other aggregates to the proper bin. "We expect many years' service from these belts," adds the plant's president, J. Roy "Cap'n" Pennell.

This is another good example of U. S. Rubber's Three-Way Engineering, in which "U. S." engineers work as a team with the plant engineers and the conveyor system engineers . . . to obtain the *right* belt for the job. This type of assistance, plus a complete line of conveyor belting, can be obtained at any of our 28 District Sales Offices, or contact us at Rockefeller Center, New York 20, New York.

In Canada, Dominion Rubber Co., Ltd.

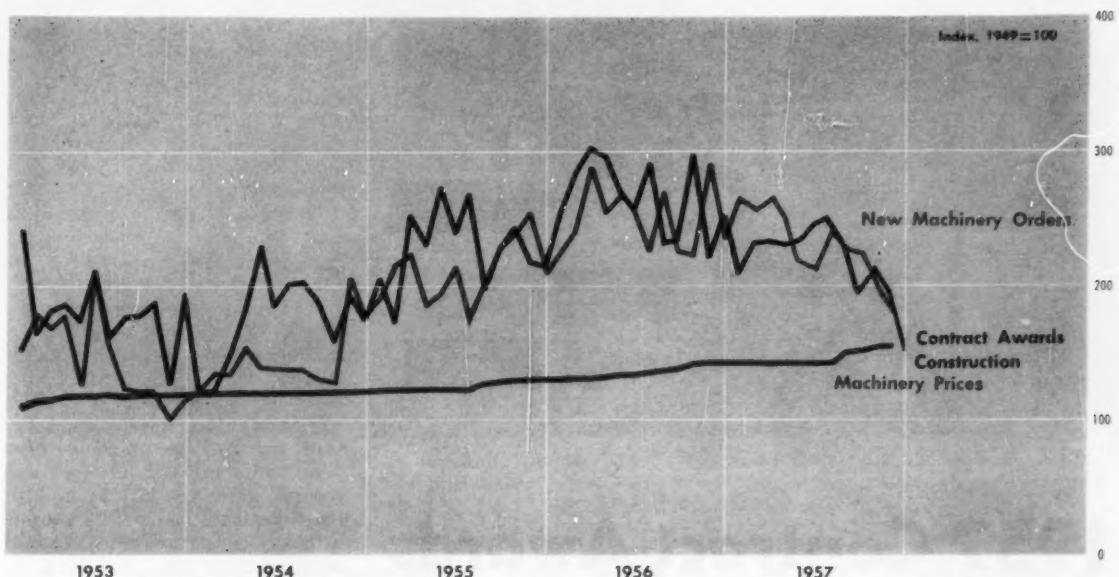
\*Greenville Concrete Co., Greenville, S. C.



**Mechanical Goods Division**

**United States Rubber**

# Trends in the Machinery Market



## Price Index

	NOV 1957	MONTH AGO	YEAR AGO	PERCENT CHANGE 1956-57
All Types of Equipment	165.2	164.9*	155.5	+ 6.2
Cranes, Draglines, Shovels	163.0	162.1*	156.0	+ 4.5
Shovel, ½ cu yd	153.7	153.7	147.2	+ 4.4
Shovel, ¾ cu yd	167.4	165.5*	158.9	+ 5.3
Shovel, 1-½ cu yd	174.3	174.3	165.8	+ 5.1
Shovel, 2 cu yd	154.4	151.4*	139.2	+ 10.9
Shovel, 3-½ cu yd	162.7	158.3	154.1	+ 5.6
Shovel, 6 cu yd	179.5	179.5	170.9	+ 5.0
Crane, truck mounted	164.2	164.2	161.0	+ 2.0
Bucket, clam shell	152.7	152.7	144.4	+ 5.7
Bucket, dragline	180.8	180.8	180.8	+ 0
Crane, tractor mounted	135.1	135.1	120.3	+ 12.3
Scrapers and Graders	158.8	158.8*	148.8	+ 6.6
Scraper, 4 Wheel, 8-8.4 cu yd	155.0	155.0	142.2	+ 9.0
Scraper, 4 Wheel, 14.4-15.2 cu yd	151.3	151.3	140.6	+ 7.6
Scraper, 2 Wheel (a)	122.7	122.7*	113.6	+ 8.0
Grader, heavy duty	164.0	164.0*	154.1	+ 6.4
Grader, light & medium	161.2	161.2*	152.2	+ 5.9
Tractors	180.8	180.8*	168.7	+ 7.2
Wheel-type, off-highway (a)	127.7	127.7*	118.6	+ 7.7
Crawler type, 37.0-45.1 dhp	182.6	182.6	171.9	+ 6.2
60.5-75.0 dhp	185.8	185.8*	174.8	+ 6.3
102.0-116.0 dhp	186.7	186.7*	172.3	+ 8.4
126.0-155.0 dhp	191.3	191.3*	178.0	+ 7.5
Machinery, Tractor Mounted	161.7	161.7*	150.8	+ 7.2
Dozer, cable control	151.6	151.6	152.1	+ 0.3
Dozer, hydraulic control	177.3	177.3*	160.0	+ 10.8
Cable, power control unit	147.9	147.9	136.6	+ 8.3
Loader, shovel type	153.9	153.9*	143.5	+ 7.2
Specialized Machinery	149.3	149.1*	141.0	+ 5.8
Ditcher	154.1	154.1	147.1	+ 4.8
Roller, tandem	193.2	193.2*	172.8	+ 11.8
Roller, 3 wheels	161.6	161.6	148.6	+ 8.7
Ripper and rooter	143.3	143.3	132.8	+ 7.9
Dewatering pump, 10 M gph	110.1	110.1	108.9	+ 1.1
Dewatering pump, 90 M gph	135.6	135.6	130.6	+ 3.8
Portable Air Compressors	159.1	159.1	148.2	+ 8.8
Contractors Air Tools	164.3	164.3	150.0	+ 9.5
Mixers, Pavers, Spreaders	145.3	145.3	138.8	+ 4.7
Mixer, portable, 6 cu ft	147.9	147.9	141.1	+ 4.8
Mixer, portable, 11 cu ft	155.4	155.4	150.0	+ 3.6
Mixer, portable, 18 cu ft	159.6	159.6	150.3	+ 6.2
Mixer, truck, 4½ cu yd	122.1	122.1	116.8	+ 4.5
Mixer, paving, 34 cu ft	174.6	174.6	163.5	+ 6.8
Concrete finisher	173.0	173.0	166.3	+ 4.0
Bituminous distributor	115.9	115.9	112.3	+ 3.2
Bituminous spreader	160.3	160.3	149.9	+ 6.9
Bituminous paver	155.3	155.3	149.5	+ 3.9

a Index based on January, 1955 = 100      \* Revised

BLS Primary Market Price Indexes, U.S. Department of Labor, 1947-49 = 100

## More Prices Go Up; Orders Slide Further

THE RISE in construction machinery prices caught up with more lines in November, bringing the 11 months increase to 6% as measured by the Bureau of Labor Statistics index of manufacturers' prices. Though this rise is substantial, it is less than the corresponding average increases of 8.7% in 1956 and 7.4% in 1955.

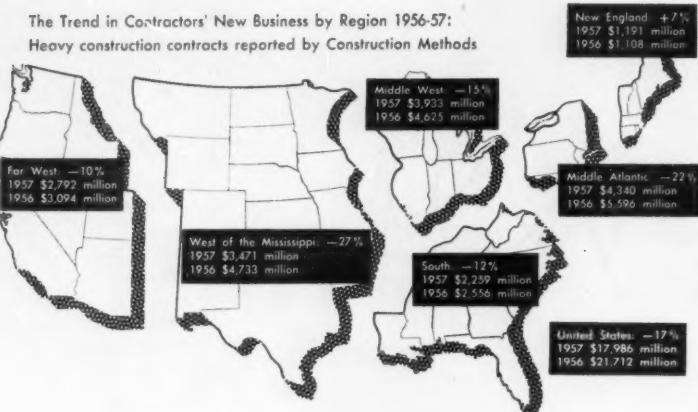
The BLS Price Index for all construction machinery reached a new high of 165.2 in November, based on average prices in 1947-49 as 100. This was slightly higher than the revised October index of 164.9. The November increases were for power shovels—3-3½-yd shovels were up 2.8%, 2-yd shovels were up 2%, and ¾-yd shovels were up 1.1%. Compared to November, 1956, the price index for 2-yd shovels was a whopping 10.9% higher. Other shovel sizes rose 4.4% to 5.6% during this 12 months period.

Once again there were substantial upward revisions in the previous month's indexes, in this case amounting to an additional 1.2% for the October overall machinery price index. And instead of only a few items moving up pricewise in October, there were many advances affecting tractors, graders, rollers, dozers, two-wheel scrapers, ¾-yd and 2-yd shovels.

While prices rose, buying tapered off as heavy construction contract awards declined. The McGraw-Hill Economics Department's New Orders Index declined for the fourth consecutive month to 182 in November (based on 1949=100), lowest since July, 1955, and 38% under a year ago. Moreover, the orders trend is below the contract award trend for the second month. In December, the contract trend was the lowest for December since 1952.

# Construction Business . . .

The Trend in Contractors' New Business by Region 1956-57:  
Heavy construction contracts reported by Construction Methods



## 1957 Contract Awards Total \$18 Billion

Contractors took on \$18 billion in heavy construction contract awards during 1957, according to Construction Methods reports. This is the third largest dollar volume in history, topped by 1955's \$18.7 billion, and 17% under 1956's colossal \$21.7 billion.

New business shifted in emphasis from private construction to public works during '57. Federal project awards zoomed 29% to \$2,185 million, while state and local public works contracts climbed 14% to \$7,415 million. Contractors signed up a greater volume of awards than in '56 for all major types of public work except sewerage projects which dipped by 4%. New records came in highways, up 20%, bridges, up 26%, waterworks, up 4%, and earthwork - dams - waterways, up 33%. Public housing doubled the 1956 volume and came very close to matching its 1951 record high. This housing gain springs from the "Capehart" military housing program.

But these gains were offset by sharp drops in awards for private heavy construction, which tumbled 38% under the 1956 high. Contractors found business off the most in industrial building, down 42%, and mass housing, off

43%. But commercial building decreased 14% and private "unclassified" (mainly pipelines, transmission lines and hydro power projects) slumped by 36%.

Total public contracts of \$9.6 billion were well above the \$8.4 billion in private awards last year. This was the first year since 1952 in which public topped private. And in that year it took some \$2 billion in atomic energy plant awards to put public in the lead. Prior to '52, you have to go back to 1949 to find public awards again leading the private contracts total.

### Only New England Up

New England is the only one of the six US regions to show a rise in contract awards in '57. Contractors booked a 7% increase in contracts for a record total of \$1,191 million. This is a new high for this region which continues to grow as a heavy construction market. Its annual contract volume has increased by one-third in the last two years and 1957's total is almost twice the 1953 volume.

In other regions, contractors found less new heavy construction available in '57 than in '56.

Declines were modest in the Far West, 10%, South, 12%, and in the Middle West, 15%. Middle Atlantic states show more of a drop, 22%, while the West of the Mississippi region experienced the greatest decline with '57 awards down 27%.

The drop in '57 new business pulls the West of the Mississippi region with its 14 states to the third ranking region in total contract volume. Previous to '57, this region had a stranglehold on the number two spot. Last year's awards were the lowest for the West of the Mississippi since 1954.

The Middle Atlantic held the lead for the fourth consecutive year while the Middle West was second highest in '57. In both of these regions, last year's volume of heavy construction was topped only by their 1955 and 1956 totals.

Though the Far West felt a drop in contracts, the '57 total was second only to its 1956 peak.

The South's contract total was higher than '54 or '55, but fell short of '56. However, the South is not producing nearly the volume of awards it did in 1950 and 1952 when atomic energy projects sent its annual totals up to \$3.6-\$3.7 billion.

### Construction Spending Up

While heavy construction contracts skidded 17% below the '56 record, spending for new construction put in place during 1957 rose 2% to a new high of \$47.2 billion, according to joint estimates by the U.S. Departments of Commerce and Labor (CM&E, Dec., 1957, p. 26).

How can spending be up while contracts are down? The two sets of figures have basic differences:

- Construction spending is for jobs let in the past—some let in the current year and others let in the year before or in previous years. For example, 1957 spending for industrial building put in place rose 3%, Commerce and Labor estimate. This spending rise represents in part the huge concentration of industrial plant contracts let in 1956 (CM figures rocketed 81% in '56) many of which were started in 1956 but were still under construction in 1957. So spending rose in '57



Four of many Caterpillar-built machines on the Great Falls Paving Project: two DW15 (Series E)-No. 428 LOWBOWL Scrapers, a D8 Tractor and a No. 12 Motor Grader. The

blocks in this area of the project are 430 feet long, and the street width 35 feet. Excavation of heavy clay soil averaged 525 cubic yards a block here.

## HIGH PRODUCERS IN NARROW STREETS

**New CAT\* DW15 (Series E)-No. 428 LOWBOWL Scrapers  
set fast pace on \$4,186,721 Great Falls Paving Project**

Four firms associated under the name of City Constructors were awarded the contract to handle the Great Falls Paving Project, Montana. The project involved the reconstruction of about 900 blocks. Among the new Caterpillar DW15 (Series E)-No. 428 LOWBOWL Scrapers on the job were these two units, owned by S. Birch Inc. & S. Birch & Sons Construction Co. Here you see them at work in heavy clay soil on a typical 35-foot-wide street.

The street was excavated to the depth of a foot for rebuilding. Loads were restricted to avoid damage to utilities and improved streets. Averaging 12 cubic yards a load, each unit made five trips an hour on a 3,000-yard round-trip haul through traffic.

This is just one of many jobs where the new DW15 (Series E) unit proved itself a high producer. In fact, in reports from other jobs, this point is clear: When the new DW15 is compared with competitive units of similar capacity, it leads the pack in performance. Many factors contribute to its superiority. For example, it has a high travel speed of 37.2 MPH with the stability of four wheels. Very maneuverable, it turns within a 35-foot diameter, and its stability permits short turns at high speeds. Its wide-section 26.5 x 25 tires provide maximum flotation. And the new No. 428 Scraper's LOWBOWL design means a faster loading rate clear to the end of the loading cycle.

The new DW15 (Series E) delivers 200 HP (maximum output capacity). The new No. 428 has a capacity of 13 cubic yards struck, 18 cubic yards heaped.

Your Caterpillar Dealer, who backs you with prompt service, will be glad to show you cost-of-operation figures on actual jobs. Better still, name the date—he'll demonstrate, right on your job!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

# CATERPILLAR\*

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experience on the design,  
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## CONSTRUCTION BUSINESS . . . continued

even though new contracts fell off by 42%. . . . On the other hand, spending on industrial construction next year is forecast to decline because of the drop in 1957 contract awards.

• Construction spending figures include all new work regardless of size. Heavy construction contracts, on the other hand, screen out projects costing below CM's project minimums for each type of work (waterworks, and

earthwork - waterways - hydro, \$44,000; other public works, \$73,000; industrial building \$93,000; other buildings, \$344,000.) Thus, the Commerce-Labor figures would include, for instance, a lot of small home and commercial building screened out of the CM contract figures.

• Construction spending figures for housing, commercial and some types of industrial building are estimates, in both coverage



Lima Roadpacker owned by N. H. Garman & Bros., Inc., Reading, Pa. Shown working on highway widening job on U. S. 22, near Harrisburg, Pa. Work involved widening outer strips of 4-lane highway by 33-in. The trench, 9-in. deep, was first lined with a 1½-in. cushion course of screenings. The entire 9-in. lift of 4-in. stone was then tightly keyed in two passes of the Roadpacker. It took only two applications of dry screenings to fill the voids.

### "LIMA ROADPACKER DOES GREAT JOB" says H. S. Garman

"We were looking for a better compactor," says Harold S. Garman of N. H. Garman & Bros., Inc., paving contractors of Reading, Pa., "and we really found it in the Lima Roadpacker. Before we made the purchase, we tried out the other leading makes. The Roadpacker proved to be the fastest machine of the lot, and did a better job of compacting to the state's tough specs. On one job we compacted to 97% of the solid rock weight.

"To get real speed on the job (picture above) we used the widening attachment, which permits two shoes to be hooked up one behind the other. This was very successful and allowed us to finish the operation in record time. Recently, using the complete set of six shoes, we set what we think might be another record when we compacted over 2200 tons of aggregate in an 8-hr. shift. For my money, the Lima Roadpacker does a great job."

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**LIMA** Construction Equipment Division, Lima, Ohio  
**BALDWIN • LIMA • HAMILTON**

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment



and the monthly rate at which work is actually put in place. CM Contract Awards are based on individual project reports.

### CEMENT PRICES UP— Can Increases Stick?

Despite rising inventories and the outlook for a more competitive market in 1958, many cement mills have upped their prices 10-15 cents per bbl, bulk, at the mill as of January 2.

As we went to press, mills in 20 states had announced increases, though not all mills in these states were marking price tags higher. Nearly all of the increases came in the states other than those in the Middle Atlantic and New England regions—except for a Buffalo, N.Y. mill and a few mills in western Pennsylvania which have upped their prices.

Rising costs have forced the price rise, according to manufacturers. A look at fuel oil prices—one of the cost items—shows a substantial increase since the Suez blockage back in '56. And labor costs and freight rates have also risen.

But cement markets are primarily local in nature. So it could turn out that just as mills in many localities are not increasing their prices now because of slack demand and sales competition, some areas which upped their prices on January 2 may have to backtrack. A spokesman for Marquette Cement Manufacturing Co. noted last month that while his firm expected to raise prices at five plants on January 1, the firm was "not sure these increases would hold in view of the spotty patterns to date."

Cement prices moved up faster in 1957 than in recent years. The December 1, 1957 average price of bulk cement, fob city, for 20 U.S. Cities was \$3.92 per bbl, according to Construction Daily (McGraw-Hill). This was 15 cents per bbl higher than on December 1, 1956. The rise compares with increases of 13 cents on the average during the corresponding 12 months ending December 1, '56 and an eight cents increase for the period ending December 1, 1955. This 3-year rise of 34 cents exceeds the increase in the cement price average for any other 3-year period since 1946-48, a period when construction materials prices in general went sailing upward.

continued on page 32

# BLOOD BROTHERS SERVES INDUSTRY

WITH UNIVERSAL JOINTS AND ASSEMBLIES  
FOR ALMOST ANY PRODUCT APPLICATION

SIZES AND TYPES FOR HEAVY-DUTY  
AUTOMOTIVE, CONSTRUCTION AND  
ROAD BUILDING MACHINES, FARM  
IMPLEMENT, TRACTORS AND INDUS-  
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Here at Blood Brothers you can select from a wide, wide range of universal joints and complete drive assemblies. Torque capacities range from 350 to 500,000 inch lbs. — lengths from very close-coupled industrial joints to assemblies 120" overall.

You can be confident they are produced in a modern, centrally located plant, toolled for precision manufacturing. And you can rely on their high reputation for dependability.

When you specify Blood Brothers, you can save valuable engineering time by stating your problem to our service-minded engineers. They're cooperative, friendly and long-experienced. Just write or call.

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ALLEGAN, MICHIGAN

UNIVERSAL JOINTS  
AND DRIVE LINE  
ASSEMBLIES

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"FINEST PERFORMANCE FOR 56 YEARS!  
WE'LL STAY WITH STANDARD"



# ON-THE-SPOT

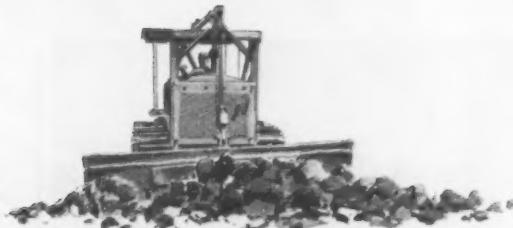
*technical service,*

*products that never fail*

*keep Palumbo Excavating Company buying STANDARD*

# FUELS <sup>and</sup> LUBRICANTS





In 1901 Joseph Palumbo found that Standard Oil lubricants worked best to keep the horsedrawn wagons rolling smoothly. Later, in 1920, his son Samuel Palumbo founded Palumbo Excavating Company. For 56 years Standard Oil Company has satisfied the company's every petroleum need.

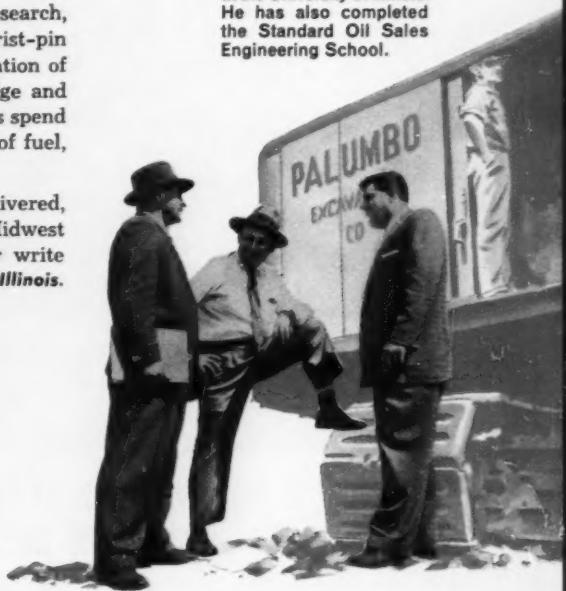
**Peter A. Palumbo**, general manager of the company and grandson of its founder, tells why: "Standard's products are superior. The service is 100 per cent . . . anywhere we have a job. We've never experienced delays from Standard Oil; I have confidence in the name Standard."

For instance, on the project pictured on this page, as on all its jobs, Palumbo has found that Standard provides the right combination to keep equipment constantly on the job: STANOLUBE HD-M Motor Oil and the technical know-how supplied by Standard Oil automotive lubrication specialists.

**STANOLUBE HD-M** gives superior service under grueling conditions. It is refined from highest-quality base stock. As a result of Standard Oil research, STANOLUBE HD-M is formulated with an additive that prevents bronze wrist-pin bushing corrosion. Other additives retard oil oxidation, minimize formation of piston ring deposits, prevent formation of excessive varnish and sludge and prevent corrosive attack on bearing metals. Standard's trained specialists spend hours on the job site to make sure equipment is never down for lack of fuel, lubrication or service.

This dependable combination—highest-quality products, promptly delivered, and skilled technical service—can be yours, too, anywhere in the 15 Midwest or Rocky Mountain states. Call your nearest Standard Oil office. Or write **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.**

**Putting Expressways Together.** Excavating for interchange joining three major Chicago-area expressways, the Palumbo Company is moving 472,000 cubic yards of earth. Here are Peter A. Palumbo, John L. Bugatto of Standard Oil and Charles Bohac, general superintendent for Palumbo. John prepared for the technical advice he gives on jobs like this by obtaining an engineering degree at the University of Illinois. He has also completed the Standard Oil Sales Engineering School.



#### *Quick facts about*

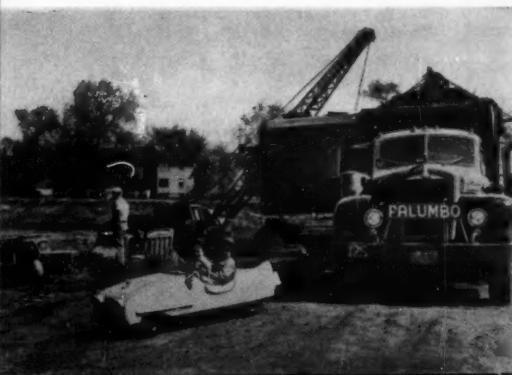
##### **STANOLUBE HD-M Motor Oil**

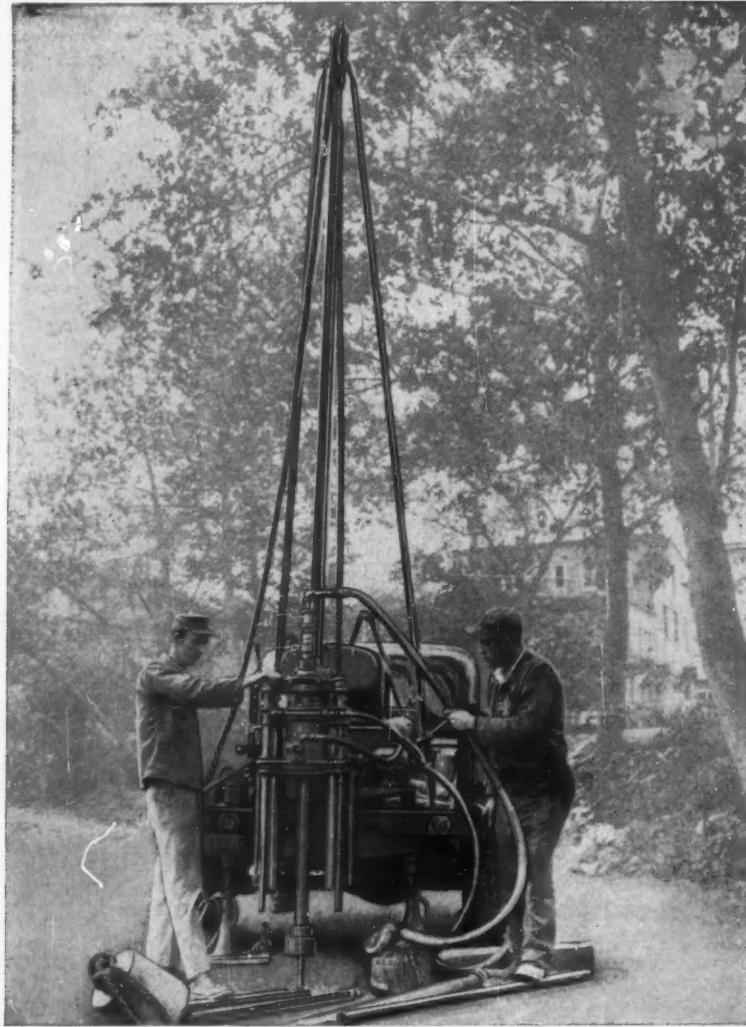
- Refined from highest-quality, solvent-extracted base stocks.
- Contains special additives that prevent bearing and bronze wrist-pin bushing corrosion, reduce piston varnish and keep rings free to seal against blow-by.
- Contains still other additives that reduce wear on heavily stressed parts.

YOU EXPECT MORE FROM **STANDARD** AND GET IT!



**Motor-minded Palumbos:** Fourth generation. Joe, and Sam, Peter Palumbo's sons, riding in their motor-driven car, hand-built by their dad. In background is one of the company's heavy-duty trucks used at the expressway project. Standard Oil fuels and lubricants keep the Palumbo equipment dependably on the go.





## SPRAGUE & HENWOOD MAKES THE EQUIPMENT FOR THE SOIL SAMPLE OR ROCK CORE YOU WANT

With the earth-shaking increase in construction, you need efficient, versatile sampling and coring equipment.

Sprague & Henwood, Inc., a leading manufacturer of all types of equipment for foundation investigation, has just the right type for you!

Illustrated above, on location, is a truck-mounted Sprague & Henwood Model 30 Core Drill Machine. On this foundation project this machine is recovering both good samples and good cores. The soil samples have already been recovered from this boring and now the machine is being used to core rock. Because of the versatility and economy of this machine it is becoming a favorite of many

contractors and other users throughout America.

The proper machine alone will not give you the good soil samples and rock cores you want. You need just the right samplers, accessory equipment and coring bits. If you need a sampler to determine only the general classification of the sub-surface soils or a sampler to secure samples for testing in a soils laboratory, Sprague & Henwood has it. There is a complete line of accessory equipment and the best in "Oriented" Diamond Bits awaiting you. One call . . . to SPRAGUE & HENWOOD, Inc., and your drilling equipment needs can be met.

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## SOME BIG CONTRACT AWARDS OF THE MONTH

**McCloskey Co.**, 1620 W. Thompson St., Phila., Pa. Social security headquarters, Baltimore, Md. for General Services Admin., 19 and F Sts., Wash., D. C. \$20,933,000.

**Vermilya-Brown Co., Inc.**, 100 E. 42 St., New York, N.Y. Twenty-four-story office tower building with two seven-story wings at Broad, Bank and Academy Sts., Newark, N.J. for Prudential Insurance Co., 763 Broad St., Newark, N.J. \$20,000,000.

**Robert E. McKee, General Contractor, Inc.**, P. O. Box 350, Glendale, Calif. Veterans Hospital building and facilities, 90-acre site, Palo Alto, Calif. for The Veterans Administration, Office of Dir. Constr., Munitions Bldg., Wash., D. C. \$19,877,500.

**United Engineers & Constructors, Inc.**, 1401 Arch St., Phila., Pa. Design and construct Hunlock Creek power plant addition near Nanticoke, Pa. for Luzerne County Gas & Electric Co., 247 Wyoming Ave., Kingston, Pa. \$10,000,000-\$15,000,000.

**O. W. Burke Co.**, 1032 Fisher Bldg., Detroit, Mich. Exhibit building and parking garage, Detroit, Mich. for Civic Center Comm., City Hall, Detroit, Mich. \$11,590,000.

**Arthur M. Andersen Corp.**, 2137 N. Marianna St., Los Angeles, Calif. Los Altos Square Entertainment Center, including theatre, restaurant, stores and offices, Long Beach, Calif. David H. Jones, 9212 Cordell Dr., Hollywood, Calif. \$10,000,000.

**Phillips Construction Co.**, 308 W. Palmer St., Charlotte, N.C. 600 unit Capehart Housing with roads, paving and utilities at Charleston Air Force Base, North Charleston, Charleston, S.C. for U. S. Air Force, Military Air Transport Service, Charleston Air Force Base, North Charleston, S. C. \$9,691,935.

**E. B. Badger Co.**, 75 Pitts St., Boston, Mass. Oil dewaxing plant addition, East Chicago, Ind. for Sinclair Refining Co., 3500 Indianapolis Blvd., East Chicago, Ind. \$8,000,000.



## *There's not a cent of capital tied up in this truck!*

With the Clark Rental Plan you use modern, efficient materials handling equipment without a cent of investment of your working capital. The savings the equipment brings are usually greater than the rental rate.

Because of the modest cost, many companies use the Rental Plan for primary equipment needs. Others, faced with peak work loads or seasonal demands, use the Plan to supplement their regular fleet. Working capital is saved either way.

You can rent for a week or a year, depending on your need. You can adjust your rental period as your requirements change. Most important, you can have the necessary equipment *when you need it* to keep operating costs down. Complete details of the Clark Rental Plan are available on request. Write: Truck Rentals, Clark Equipment Co., Battle Creek, Michigan.

**CLARK**  
**EQUIPMENT**



## How to Install Rock Anchor Bolts

These are the four easy steps when you install the Bethlehem wedge-type rock anchor bolt. The 1-in. diam slotted bolt locks itself into the rock formation, anchoring the rock layers so tightly that it is virtually impossible for serious rock slides to endanger traffic.

In addition to the wedge-type bolt, Bethlehem also makes a  $\frac{3}{4}$ -in. diam headed anchor bolt, used with an expansion shell. Both bolts are easy to install, and provide positive locking action.

If you would like to know more about the use of Bethlehem anchor bolts in minimizing danger from rock slides, our engineering staff is at your service. Just drop a line to the nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



**BETHLEHEM  
STEEL**

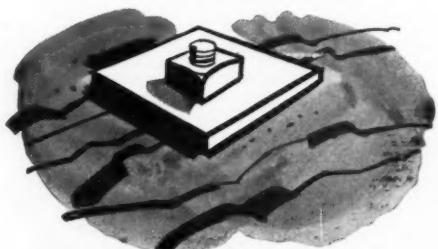
**1** Wedge is inserted in slotted end of anchor bolt. The  $1\frac{1}{4}$ -in. hole has been drilled previously, to depth 3 in. less than length of bolt.



**2** Bolt is inserted through opening in steel anchor plate (rock anchor tie and plate may be used instead), then placed in the hole.



**3** Bolt can be driven by same equipment used in boring hole. Dolly protects threads. Wedge drives deep into bolt, spreading slotted portion. Impact wrench is used in tightening nut.



**4** With the nut drawn up tightly, the steel anchor plate bears against the rock surface, providing additional support.

# Tunel de la Habana, Habana, Cuba

## Remarkable engineering accomplishment, protected from water with the Thoro System Products

Four-lane, underwater tunnel, connecting Malecon Drive, City of Havana, Cuba with Guanabacoa near the famous Morro Castle, opening the sparsely-populated peninsula to residence and commercial activity.

Design, engineering and construction by Societe des Grand Travaux de Marseilles, Paris, France, 733 Meters Long, 23 Meters Wide, 7 Meters High, cost \$28,500,000.00. Waterproofed inside and outside with THORO System products, THOROSEAL, WATERPLUG and THORITE. Two lanes will be opened by December, 1957.



From Havana side, tunnel entrance grades down to harbor pool level.



Preparing interior surface for WATERPLUG and one brush and one trowel coat of THOROSEAL. All walls, floors and ceilings are sealed with THOROSEAL.



Two double-lane tunnel sections take shape; forms will be filled with poststressed concrete.



Precast sections of tunnel, honeycomb patched with THORITE Patching Mortar and entire surface protected with THOROSEAL.



Mammoth precast concrete sections are floated to location by attached pontoons, lowered 24 meters under water and connected to previously-sunken sections. **Note the famous Morro Castle. Top, center background.**



### Thoro System Products applied, completes the job!

THOROSEAL is being applied to all interior surfaces. Over 800 drums of WATERPLUG have already been used, where water was entering and where sections were joined together. All honeycomb and construction faults were sealed with THORITE Patching Mortar, before lowered to position in the bay.



Thousands of drums of THOROSEAL, WATERPLUG and THORITE Patching Mortar are being used on this vast project, which will be completed in February, 1958.



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"HOW TO DO IT"**



**Standard Dry Wall Products, Inc.**  
NEW EAGLE, PA. CENTERVILLE, IND.

# Only PAYLOADER® can give you



## as a Side Boom . . .

. . . this new SUPERIOR-HOUGH boom attachment further increases the all-around usefulness of a "PAYLOADER" tractor-shovel. A Hough exclusive on rubber-tired units, it adds a handy lift-and-carry facility, lets the "PAYLOADER" alternate between boom and bucket work at any time.

You can load, unload and string pipe, carry girders and sheet steel, handle piles and poles . . . or, dig and backfill dirt, load dump trucks, charge hoppers and the like—all without any time loss to change attachments.

Available for the big model HO "PAYLOADER", this side boom has 6000 lb. capacity, its 10 ft. length can be telescoped to 16 ft. maximum. This, combined with the sturdy 4-wheel-drive tractor-shovel performance, provides an economical one-machine answer to many construction problems.

Big rubber tires permit working on pavement, over sidewalks and curbs without damage; 4-wheel-drive tractive power qualifies it for cross-country work as well.



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MANUFACTURED BY  
THE FRANK G. HOUGH CO., LIBERTYVILLE, ILL.  
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY



1-B-1 A



## as a Spreader . . .

. . . another new and exclusive attachment that multiplies the work-ability of "PAYLOADER" tractor-shovels. Substitute this Ram Spreader attachment for the bucket and you have an economical unit that lays down 8-ft. wide strips of hot or cold mix asphalt in a single pass.

You can use it to place new pavement, to do resurfacing or patch work on streets, driveways, alleys, sidewalks, playgrounds, parking lots. Attached to the maneuverable "PAYLOADER", the machine can work in close quarters where pavers and trucks can't operate.

Spreader features include a 2-cu. yd. capacity hopper that is independently suspended on four pneumatic tires. A separate air cooled gas engine provides pressure for the hydraulic motor drive of the twin 8" diameter augers and for all hydraulic control cylinders.

Operator has convenient control levers to adjust main feed gate, thickness and width. Sliding type gates adjust for widths to 48 in.; gates are removed for 8-ft. width. See your nearby "PAYLOADER" distributor for complete details.



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1-B-1 B

# this Versatility, Speed and Economy



## as a 4-in-1 ...

... a "PAYLOADER" handles many jobs other wheeled tractor-shovels can't touch. Equipped with a DROTT "4-in-1" bucket, it combines shovel, clamshell, scraper and bulldozer action in a single tool.

The "4-in-1" actually gives you the utility performance of four machines plus the mobile speed and tractive power of a 4-wheel-drive tractor-shovel. "PAYLOADER" is the only rubber-tired tractor-shovel available with this patented "4-in-1" bucket.

This combination of rubber-tired tractor mobility and bucket versatility provides complete on-job flexibility. You can dig, carry and dump (shovel) . . . pick-up, grasp and handle (clamshell) . . . scrape, strip, grade and spread (scraper) . . . backfill, clear and doze (bulldozer).

Reliable 4-wheel-drive "PAYLOADER" performance is assured by power-transfer differentials, "no-stop" power-shift transmission and torque converter, planetary final drives, power-steering and power-brakes plus exclusive 40° tip-back at ground level.



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1-B-1 C



## as a Back Hoe ...

... the "PAYLOADER" becomes a mobile trenching unit. With a quick interchange of bucket and hydraulically operated Wain-Roy hoe attachment it can work in a 190° radius, dig to 12' depth to install service connections, foundations, bell-holes and footings easily and economically. It can dig and dump at any angle up to 95°, right or left—a valuable feature in close quarters and heavy traffic areas.

The unit operates with only four control levers. Twin hydraulic cylinders provide a powerful digging and break-out force. Self-leveling hydraulic stabilizers relieve the tractor of undue strains. The extra work capacity you get with this back-hoe attachment at a nominal investment is worthwhile.

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needs for the purchase of "PAYLOADER" equip-  
ment. See him today!

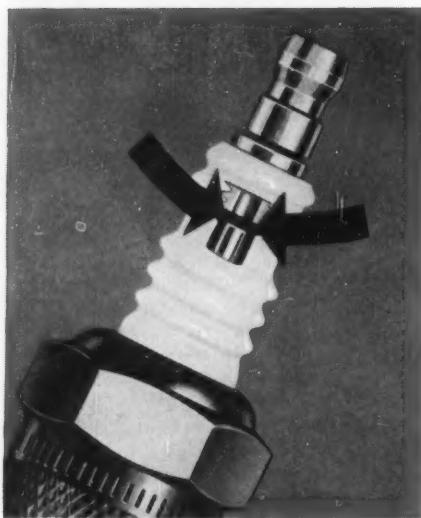
\*Available in Continental U.S.A.)

1-B-1 D

In near constant idling...or low r.p.m. operation

# Champion solves problem of excessive spark plug fouling!

New auxiliary-gap type Champion Spark Plugs keep engines firing smoothly far longer than ordinary plugs . . . sharply cut trouble and expense of replacing or cleaning fouled plugs. Here's how these new Champions work.



Arrows point to auxiliary gap that allows voltage to build up to a sparking intensity before it reaches the electrodes. In regular plugs, carbon deposits often drain away voltage as fast as it builds up. This fouling condition is the prime cause of misfiring in engines that seldom operate at full power.

When gasoline engines run for long periods at low speeds, spark plugs often load up with carbon and oil deposits.

Under these conditions, spark plugs cannot get hot enough to burn off these deposits . . . voltage leaks to ground . . . and spark plug misfire occurs.

Use of a "hotter" spark plug may help burn away deposits when idling is not too prolonged. But in those operations where deposits form fast—Champion's new auxiliary-gap type plugs are needed.

#### Auxiliary Gap Makes the Difference

These new Champions have an internal auxiliary gap near the terminal. The auxiliary gap provides greatly increased protection against fouling by isolating ignition system output from the plug's firing end. Without this auxiliary gap, fouling deposits may bleed away voltage as soon as it is built up in the coil. As a result, a spark cannot be formed at the electrodes.

With the auxiliary gap, however, voltage is allowed to first build up sufficiently at the spark plug terminal. Thus—for normal firing—adequate voltage is suddenly delivered at the electrode gap.

#### Real Benefit to Operators

These new Champions have proved a real benefit to operators, such as yourself, who may be plagued by constant plug fouling. They greatly reduce the trouble and expense of having to pull and clean—or replace—spark plugs frequently. And they can keep your equipment in service and earning money during those periods when it used to be tied up for ignition work.

And yet these new Champions cost no more than regular plugs!

Your Champion supplier or representative can recommend the particular auxiliary-gap Champions that fit your equipment. Call him now and start saving on operating costs.

Always choose 5-rib

**CHAMPION**  
SPARK PLUGS



CHAMPION SPARK PLUG COMPANY  
TOLEDO 1, OHIO

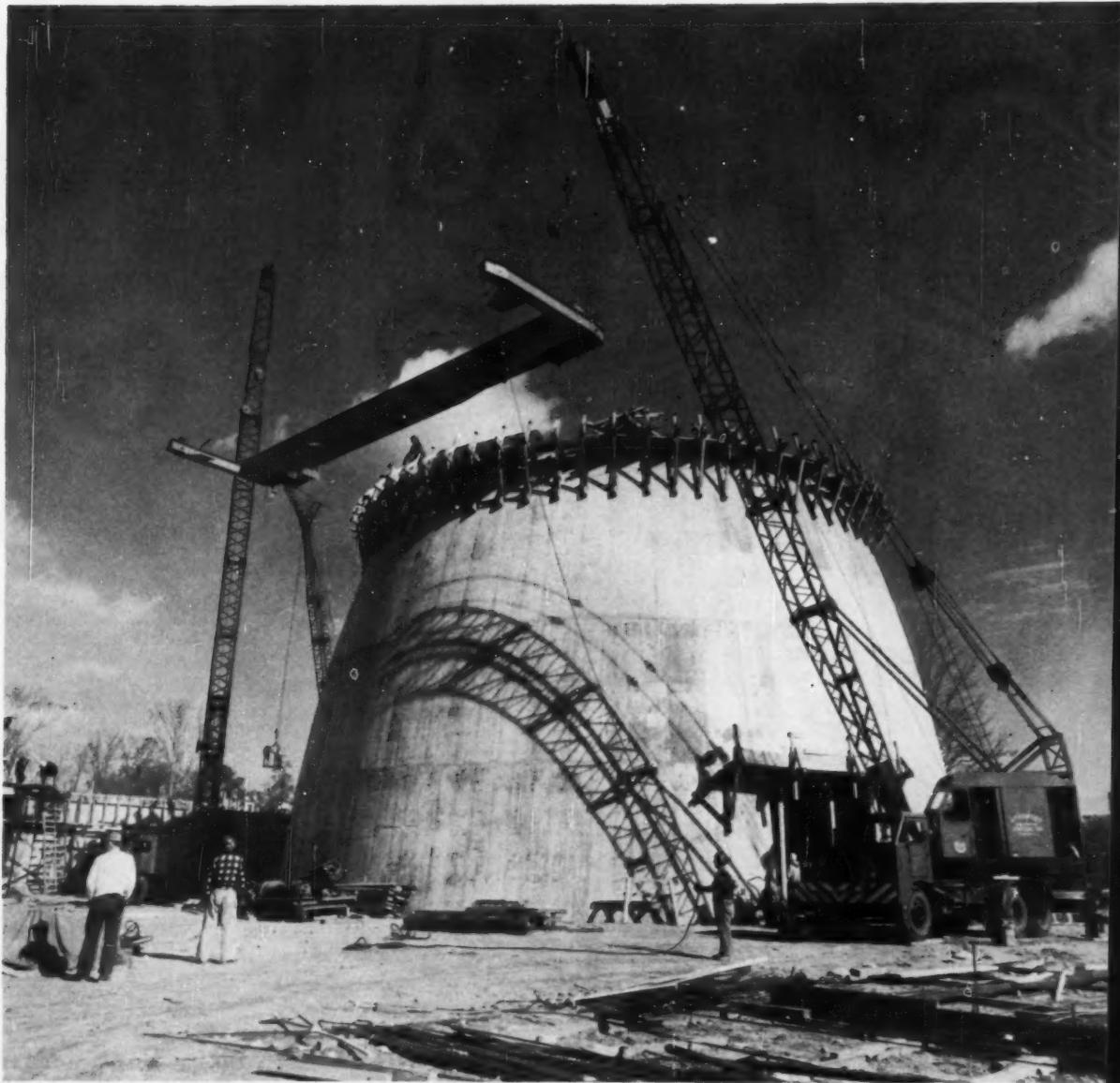
CHAMPION CUTS  
PLUG FOULING  
IN THE  
CONSTRUCTION  
INDUSTRY

A construction firm in Bossier City, Louisiana, reports a concrete leveler fouled plugs within 72 hours. But auxiliary-gap Champions were still in service after three months.

An Inglewood, California, cement contractor had a concrete mixer that fouled plugs

within three months. Auxiliary-gap Champions lasted 2½ times longer.

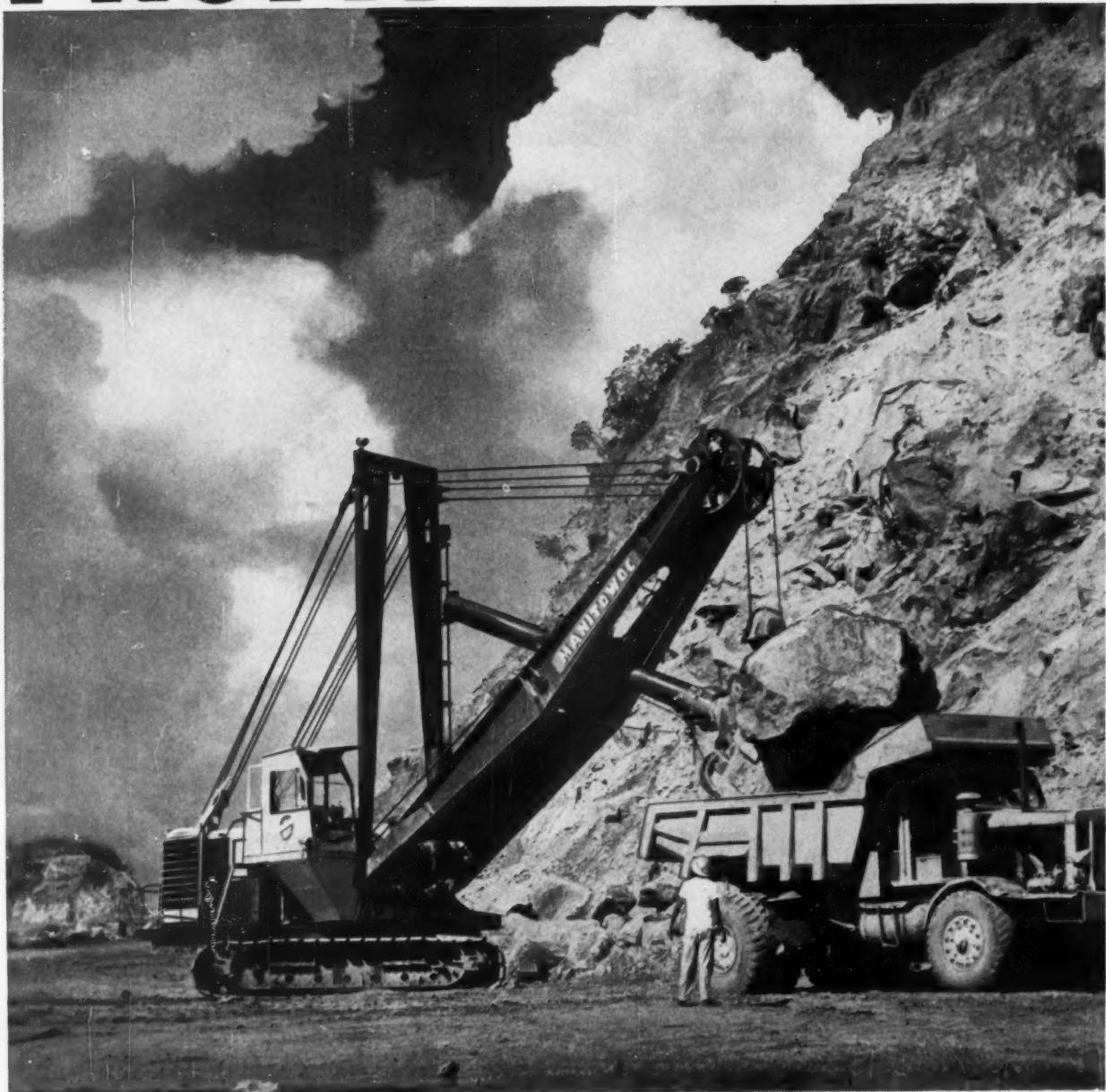
A crane operator in Los Angeles, California, had a gasoline-powered crane that fouled plugs within 150 hours. Two months after installation Champion auxiliary-gap plugs were still in service.



## Atomic Construction

• Two Link Belt Speeders hoist one of the two steel girders for an overhead crane within the concrete haystack dome that will shield an atomic research reactor near Princeton, N.J. Turner Construction Co. of New York City is building the \$3-million research facility for a group of 10 major industrial firms. When completed, the structure will be 87 ft high and 87 ft in diameter. Turner has poured three lifts of 12-in.-thick walls and will complete the dome with a 3-in. gunited cap. A major problem was forming the tricky two-way curvature of the thick walls. Job-built wood forms did the trick.

# BEEF-UP YOUR PROFIT MARGIN



# Manitowoc gives you a higher return from your equipment investment

When it comes to making a profit on those low bid, narrow margin jobs it's the equipment you use that makes the difference between profit and loss. It is essential that you have equipment that's fast, dependable, versatile and powerful enough to handle any job that comes along . . . equipment that keeps output high no matter how tough the schedule.

To beat the competition and still make money on low bids, you can depend on Manitowoc to move more yardage for you at the lowest cost per yard. Here's why . . . every Manitowoc unit has fewer moving parts . . . simpler design . . . than any rig in the field today. No Manitowoc excavator has more than 17 gears or pinions in the entire machine . . . most Manitowocs have less! An exclusive slide pinion arrangement eliminates

all wasted power because only working gears turn. You add power by saving power.

Because no other excavator is as simple as a Manitowoc, you get faster working cycles, greater output each shift and less downtime . . . more working time to finish jobs ahead of schedule. In addition to greater speed, every unit gives you an extra measure of performance . . . providing bonus output well above rated capacities. You can tackle the toughest jobs with confidence.

Let Manitowoc beef-up your profit margin this year . . . make more money for you even on the low-bid contracts. There's a complete range of Manitowoc rigs (see table below) to match any job . . . call your Manitowoc distributor today for the full, profitable story.

**Manitowoc Engineering Corp., Manitowoc, Wis.**

**there's a cost-saving Manitowoc to make any low bid profitable**

	SHOVEL	CRANE	DRAGLINE	TRENCH HOE
<b>model 1600</b>	1 yd.	20 Ton	1 yd. to 1½ yd.	1 yd.
<b>model 2000</b>	1¼ yd.	25 Ton	1¼ yd. to 1½ yd.	1¼ yd.
<b>model 2800 mobile crane</b>	.....	40 Ton	2 yd. to 2¼ yd.	.....
<b>model 3000</b>	2 yd.	40 to 50 Ton	1¾ yd. to 2¼ yd.	2 yd.
<b>model 3500</b>	2½ yd.	60 Ton	2 yd. to 2½ yd.	.....
<b>model 3900</b>	.....	60 to 80 Ton	3 yd. to 3½ yd.	.....
<b>model 4500</b>	5½ yd.	100 Ton	4 yd. to 6 yd.	.....



**MANITOWOC ENGINEERING CORP.  
MANITOWOC, WISCONSIN**

**CRANES | SHOVELS | DRAGLINES | TRENCH HOES**  
20 TON - 100 TON    1-YD. - 5½-YD.    1-YD. - 6-YD.    1-YD. - 2½-YD.



SIX OF THESE JAEGER 600'S POWERED THE EXCAVATION DRILLING FOR NEW TIME & LIFE BUILDING, NEW YORK CITY

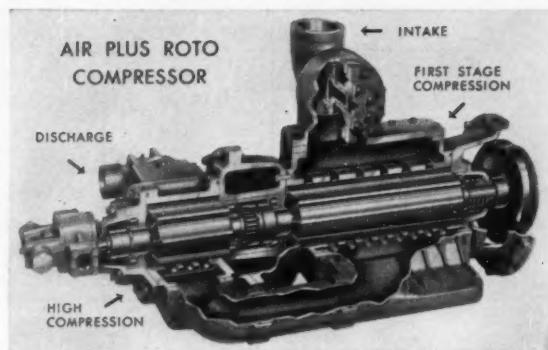
## Jaeger gives you a lower, known cost for air

**"MAKES" 600 CU. FT. OF AIR IN  
1650 REVOLUTIONS ON 1.2 LBS. OF FUEL**

Using the same GM 6-71 diesel engine, a Jaeger "600" delivers the same air volume at 1650 rpm that all other rotaries need 1800 rpm to produce.

In 8 hours' steady operation, a Jaeger averages 72,000 fewer revolutions, saving miles of engine piston travel and pounds of fuel. Because operation is always below the continuous horsepower curve, engine maintenance is lowest. As for the compressor unit, *many Jaegers have been operated more than 8000 hours without replacing a single vane.*

Similar high efficiency at low speed (1700 rpm full load speed compared with 1800 to 2150) is characteristic of Jaeger 125, 250 and 365 models. Check with any Jaeger user—or ask your Jaeger distributor for complete information that will help you cut your air costs on coming work.



Jaeger oil-cooled 2-stage, single axis compressor unit—the first fully efficient rotary compressor. All sizes average an output of 500 cu. ft. of 100 psi air per pound of fuel consumed.

**THE JAEGER MACHINE COMPANY**

800 Dublin Avenue, Columbus 16, Ohio

PUMPS • SPREADERS • FINISHERS • CONCRETE MIXERS • TRUCK MIXERS

# **Construction News in Pictures . . .**

## **Starting the Pour**

The 28-story Kaiser Center Building in Oakland, Calif., will "float" on a heavily reinforced 62x416-ft concrete slab 5 ft thick. Foundation contractor McDonald, Young & Nelson of San Francisco will complete the slab in six separate pours totaling about 6,000 yd by mid-February. An additional 5,000 yd will go into the walls of the deep foundation. Reinforcing bars in the slab are 62 ft long, weigh 1,000 lb.



## **Mountain Highway**

An International TD-24 tractor spreads fill on one of the roughest roadbuilding jobs in the U.S. Gibbons & Reed of Salt Lake City, Utah, will move more than 1,000,000 cu yd of material, most of it rock, to widen a 5.4-mi stretch of U.S. 40 where it passes through the Truckee River Canyon in Nevada, near the California state line.

## **Prestressed Framing ▶**

Precast and prestressed concrete members will frame the three-story press room of the new Cleveland Press Building in Cleveland, Ohio. Columns stand 35 ft high and weigh 11 tons. Haunches in the columns support 30-ft girders that weigh 12 tons. The shallower beams weigh 4½ tons. The Austin Co. is erecting the buil

*continued on page 46*





Vernon (Stub) Faber doing a rough grading operation on a highway widening project inside the city limits of Milwaukee, Wis. The machine is an Austin-Western Super 99 with 6-wheel drive and 6-wheel steer.

## "I've operated every make of grader and this A-W Super 99 outperforms them all"

**says Vernon (Stub) Faber**

As a "boomer" grader operator, Vernon (Stub) Faber has spent the past 16 years on construction jobs all over the country. He has run every make of grader under almost every conceivable operating condition. There isn't much he doesn't know about graders.

Here's what Stub Faber has to say about the A-W Super 99. "I've operated every make of grader, and this A-W Super 99 outperforms them all. It's maneuverable, and you can see everything from an Austin-Western—this is very important for finish grading. The A-W actually speeds up a

grading operation, because it does not have to slow down for the grading of intersections. I like the A-W for slope grading, too. With the hydraulically controlled blade, you don't have to leave your seat to change the blade and the all-wheel steer gives you a good grip on the slope."

### **30% more power — extra maneuverability**

Like the famous A-W 4-wheel machine, the new Super 99 features a unique combination that gives it unbeatable performance. With all-wheel drive, you get sure traction under all

conditions, plus 30% more power where you need it — at the blade. All-wheel steer gets the grader where you want it in the shortest time; holds every wheel where the footing is best. Teamed together, all-wheel drive and all-wheel steer let you move more material farther and faster because of directed power on every wheel.

### **Superior blade control**

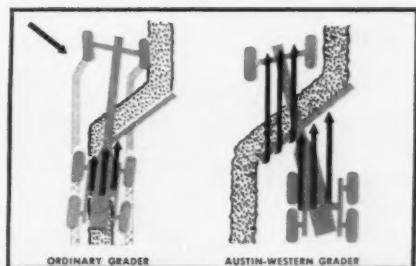
A-W precision sideshift always puts the blade where it's needed. Ends of the blade stay on the ground with no change in the working angle. For top performance on any bank and un-



all blade movements, increasing efficiency and reducing operator fatigue.

equaled reach, the high-lift blade can be operated through the full range of 90° left or right. And because the blade is completely reversible, reverse grading on narrow roads or between forms is easy with use of the rear steer. Precision hydraulic controls, instantly responsive to a finger's touch, speed

Preference for A-W graders is the rule, rather than the exception, among contractors and the experienced operators who know them. You can take an A-W more places, move more dirt, do more jobs, and handle them with less effort than with any competitive machine. As a contractor, you'll want to get the complete A-W story. Write today for free booklet.



An ordinary grader with little material to push moves ahead in a straight line. But when a heavy windrow is tackled, side thrust causes the dead front end to go out of control and slip sideways.

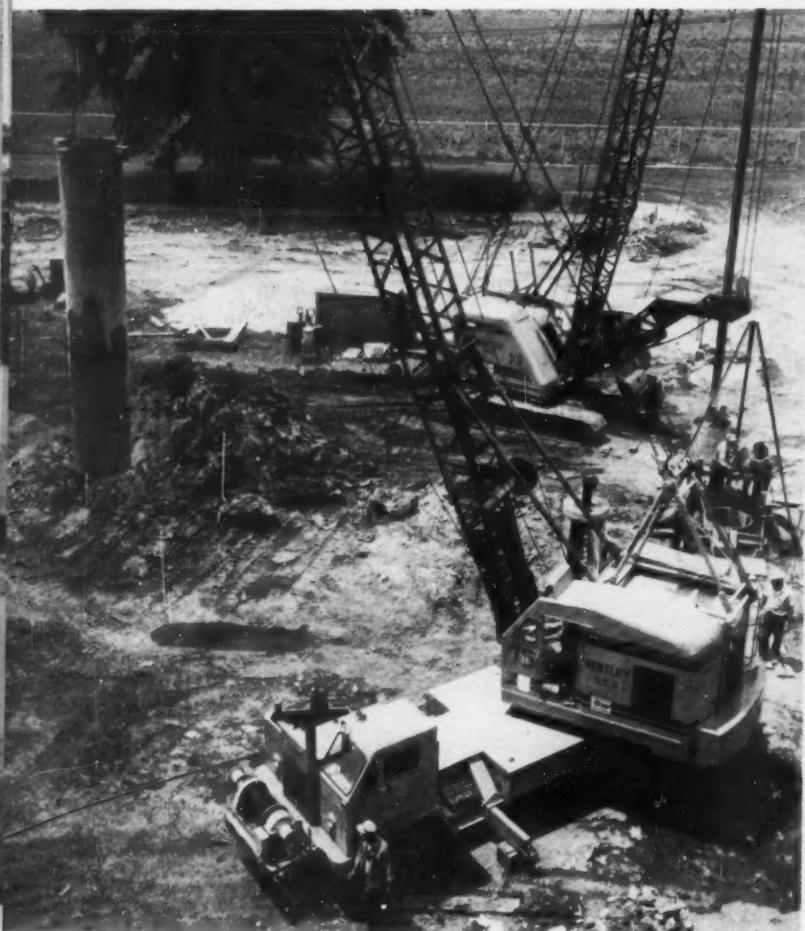
On A-W graders, all-wheel drive and all-wheel steer team up with the blade — the rear drivers push behind the toe of the blade, the front drivers pull ahead of the heel of the blade. As a result, the machine moves straight ahead under perfect control.

## Austin-Western

BALDWIN · LIMA · HAMILTON

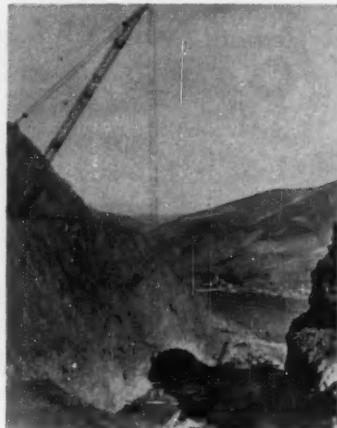
Power graders • Motor sweepers • Road rollers • Hydraulic cranes





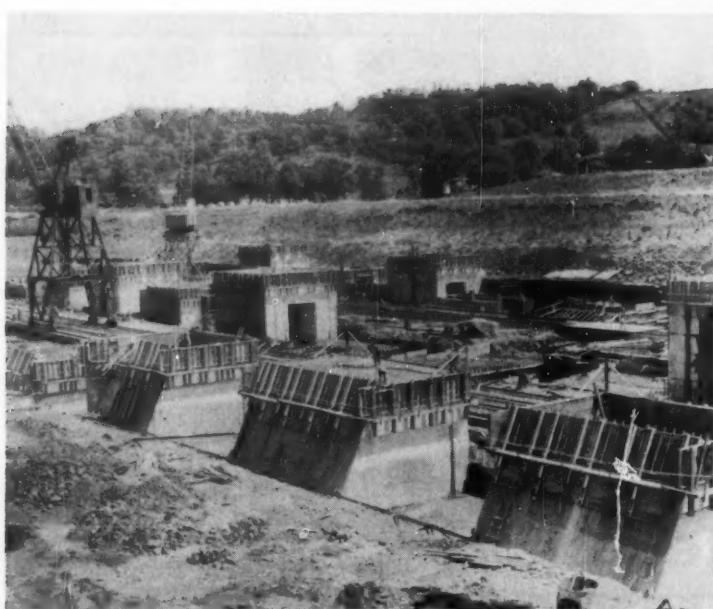
### Drilled Caissons

In less than two months, A. Bentley & Sons of Toledo, Ohio, drilled and poured 160 concrete footings for a 180,000-sq-ft addition to the Allied Chemical plant in Toledo. Two Gar Wood foundation borers drilled the 3-ft dia holes 75 ft deep to bedrock through sectional steel caisson shells. Average drilling time per hole in boulder clay was 1 hr.



### Two at a Time

Stiffleg derrick with a 207-ft boom pours concrete around the clock on the spillway of Brownlee Dam, the Idaho Power Co.'s big hydro-electric project on the Snake River. The derrick picks up two buckets of concrete at a time from delivery trucks. The 168-ft high spillway will require 115,700 yd of concrete. Contractor is Morrison-Knudsen



### Ohio River Locks

Gantry cranes pour 5-ft lifts of concrete into Blaw-Knox adjustable cantilever steel forms for the new Markland Locks on the Ohio River, 60 miles downstream from Cincinnati. Dravo Corp. of Pittsburgh is building the two 110-ft wide locks, one 1,200 ft long and the other 600 ft long, plus two 1,000-ft guard walls at either end of the locks.

**CONTRACTOR SPEEDS CONCRETE POUR ON SEWAGE PUMPING STATION IN BALTIMORE,  
while a MORETRENCH WELLPOINT SYSTEM CONTROLS 18' OF WATER IN  
mixed sand and clay layers overlying hard red clay . . . . .**



*We'll let him tell the story:*

"We poured 320 yards of concrete in just under five hours which is certainly a record for us. Just think how complicated the procedure of digging clay, building forms, and pouring concrete would have been, if we had used sheeting and bracing. As it worked out, we were able to run as many as four concrete trucks around the bench at one time.

Without question, MORETRENCH WELLPOINTS helped us save time and money on this job!"

Jerry Falk  
Eager Stone & Construction Company  
Baltimore, Maryland

For instant help on any pumping problem, call our nearest office.

**MORETRENCH  
CORPORATION**

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Tampa 61-1881

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Underwood 4-7774

Rockaway  
New Jersey  
Rockaway 9-210

Western Representative: Andrews Machinery of Washington, Inc., Seattle 4, Washington

Canadian Representative: Geo. W. CROTHERS Limited, Toronto, Ontario

Brazilian Representative: Oscar Tavares & Co., Ltd., Rio de Janeiro

*San Francisco garage demonstrates* **Three  
of fir plywood**



*Fir plywood forms produced super-smooth concrete surfaces, helped speed construction of this San Francisco parking garage.*

# key advantages concrete forms



## 1. speed of construction

Forms of  $\frac{5}{8}$ " fir plywood were specified for pouring on San Francisco's unique 11-level Downtown Center Garage. George A. Gore, head of the managing firm for the privately owned self-service parking structure, reports construction costs of approximately \$1,400 per car stall. Fir plywood permitted speedy erection and demounting of form sections.

*Open construction removed the necessity for mechanical ventilation on this unusual structure. The garage has room for 1200 cars on the eleven levels; the area per car stall, including space for aisles, ramps and driveways, totals about 350 square feet.*

## 2. smooth concrete surfaces

Because of fir plywood forms and the use of vibrators, concrete surfaces were exceptionally smooth. No plaster was required. A rubber-base synthetic paint was sprayed directly onto the concrete.



## 3. economy through re-use

Caps, twelve feet on a side, were formed with fir plywood on the tops of supporting columns. These forms gave 10 re-uses; five pours were possible with the plywood forms used on larger surfaces. More than 16,000 cu. yds. of concrete went into the structure.

*This 11-level garage has attracted world-wide attention because of its unique spiral ramp design and low manpower operating requirements. Further studies by Architect George A. Applegarth, San Francisco, indicate that similar structures could be built, with fir plywood forms, at a cost as low as \$2.50 per square foot.*



Douglas Fir Plywood Association is a non-profit, industry organization devoted to research, promotion, quality maintenance.

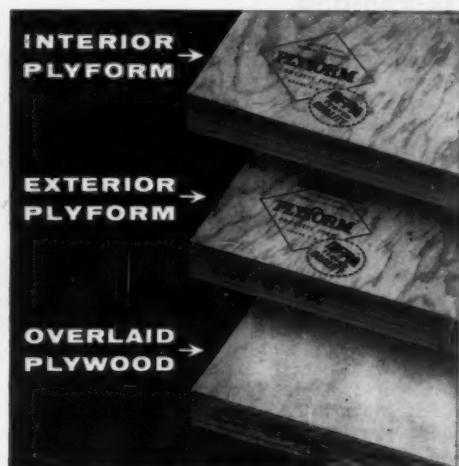
### ALWAYS SPECIFY BY DFPA GRADE - TRADEMARKS

INTERIOR PLYFORM®—standard concrete form grade made with moisture-resistant glue. Gives multiple (10-12) re-uses.

EXTERIOR PLYFORM®—standard form grade made with waterproof glue. Gives maximum (25 or more) re-uses.

OVERLAID FIR PLYWOOD—special panel with hard, glossy fused resin-fiber surfaces. Waterproof glue. Up to 200 re-uses.

FOR YOUR FILES: Complete application-specification-design portfolio assembly. Write (USA Only) Douglas Fir Plywood Association, Tacoma 2, Washington, Dept. 136.



### DOWNTOWN CENTER GARAGE

LOCATION: San Francisco, California

ARCHITECT: George A. Applegarth, San Francisco

CONTRACTOR: Cahill Construction Co., San Francisco

## ***Construction 'Round the World . . .***



### ***In Brazil***

Caterpillar scrapers move earth through primitive Brazilian plains for a 25-mi road that will connect Annapolis to Brasilia. Road will be temporarily stabilized, and later it will be paved with bituminous concrete. Contractor Marco Polo Ra-

bello of Brazil says sandy-clay soil proves no problem for scrapers. Real problem workmen face is keeping a sharp lookout for the deadly coral snakes that infest the construction site along the entire right of way. Workmen get chief protection from scrapers which manage to bury most snakes.

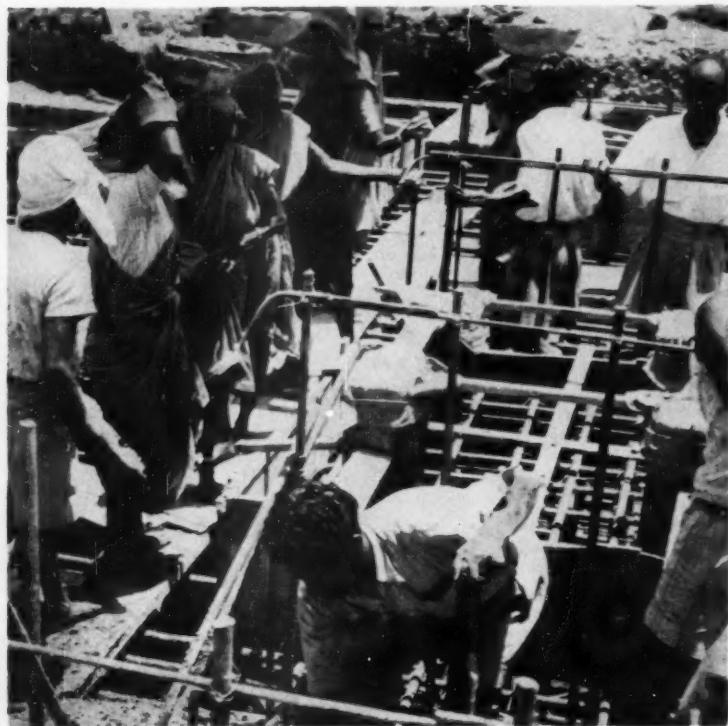


### ***In England***

British railway engineers inspect underside of bridge from a rail-mounted unit fitted with an elbow-jointed arm. Arm, operated from diesel-powered truck moored to the bridge by special anchors, will permit fast minor repairs to undersides of bridges and culverts.

### ***In India***

Female hod carriers form a human conveyor to deliver concrete that will go into foundation of the Trombay Thermal Power Station Extension of the Tata Power Co. Men at each end of human line load and unload the hods which when full weigh up to 50 lb.



# How prompt payments will help cut highway costs

When a contractor bids the big jobs coming up on the Interstate Highway program, he must take into consideration the cost of financing. This is true whether he has ample capital or whether he must borrow funds to finance his expenses. He must include in his bid present high interest rates on all his costs caused by deferred work payments. He must allow for this interest burden for all the months until completed work and authorized payments can catch up with his accumulated job costs. Not only does his problem of financing include the actual cost of producing the unit-pay items, but it also includes:

- Cost of pre-survey of job site, study of blue prints, job planning, estimating, and bidding.
- Cost of his performance bond, and all his job insurance policies.
- Cost of staffing for the job ahead.
- Cost of special equipment needed to fit job requirements.
- Cost of modernizing his equipment fleet to obtain lowest cost of work in place.
- Move-in costs including offices, shops and housing.
- Cost of job-supply inventory... repair parts, fuel, oil, tires, as well as stockpiles of aggregates, cement, steel, etc.

- Initial make-ready work on haul roads, drainage, etc., prior to start of paid production.
- Financing cost of payroll and job supplies, not only prior to initial payments, but until current payments accumulate enough surplus to repay the initial job investment.

In many states, "hold-back" provisions intended to protect the government investment in contract payments have been built up and added to over the early years when we had smaller jobs and contractors with limited capital and small investment in equipment. The theory was to make "assurance doubly sure". As our jobs became larger, more highly mechanized, and required a tremendous increase in a contractor's initial expense and financial responsibility, these well intentioned, multiple safeguards have, in many states, been retained at an added cost in bid prices far beyond their need or worth to the contracting agency.

If every road-building department will give this problem careful study and consideration, we believe equitable and more liberal safe payment arrangements can be more widely applied. This will encourage more competitive bidding, lower costs, and faster completion of the gigantic road-building program ahead of us.

The contractor is "worthy of his hire"... his money, too, is worthy of its wage.

1726-G-1

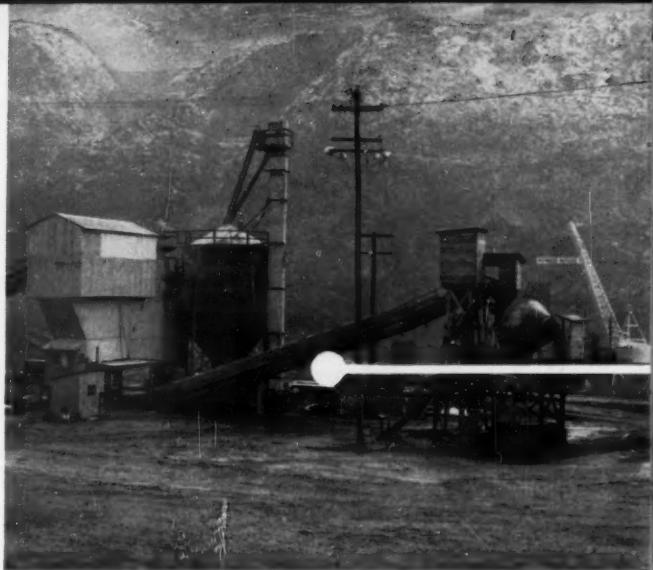
**LeTourneau-Westinghouse Company**  
PEORIA, ILLINOIS  
A Subsidiary of Westinghouse Air Brake Company

# **NOBLE-MOBILE does the work of ing all concrete for large hydro-**

**Plant-on-wheels batches 132,000 cubic yards at job site permitting joint use by 2 contractors. Costly erection and investment in second plant saved.**

The Swift Hydroelectric Project for Pacific Power and Light Co., Cougar, Washington, 45 miles from the closest ready-mix plant, requires ready availability of quality concrete for construction of dam, power tunnel, intake and spillway structures, and two powerhouses. Available space for batching plants and aggregates storage at the river bank was limited. NOBLE-MOBILE, a compact, 100% complete plant, was driven to the site and put into operation at relatively low cost. Plant is used jointly by Jones and Tompkin, owner, and Guy F. Atkinson Co. Output is completely adequate for each contractor's needs; quality is consistent with the strict specifications of Bechtel Corp., engineers on the project; hauling distances are short . . . ranging from only a few yards to a maximum of 3 miles to the downstream powerhouse.

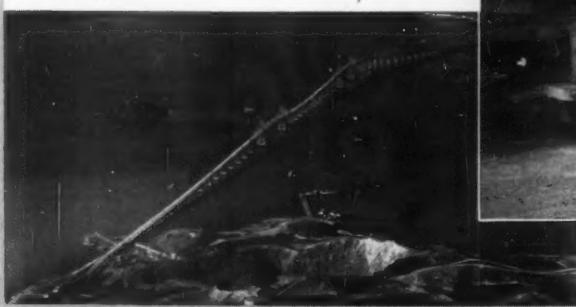
On this project the NOBLE-MOBILE is a wet mix operation with a Smith 112-S tilting mixer charging to Dumpcrete trucks. Erected cost is far less than a conventional stationary central mixing plant. 3", 1½" and ¾" aggre-



gates and sand are charged by a conveyor fed by a front end loader. Present cement storage capacity of 1000 barrels (625 in plant, 375 in ground storage silo) is being increased to 3000 barrels with the addition of a second ground storage silo. Aggregate bin storage capacity is 100 tons.

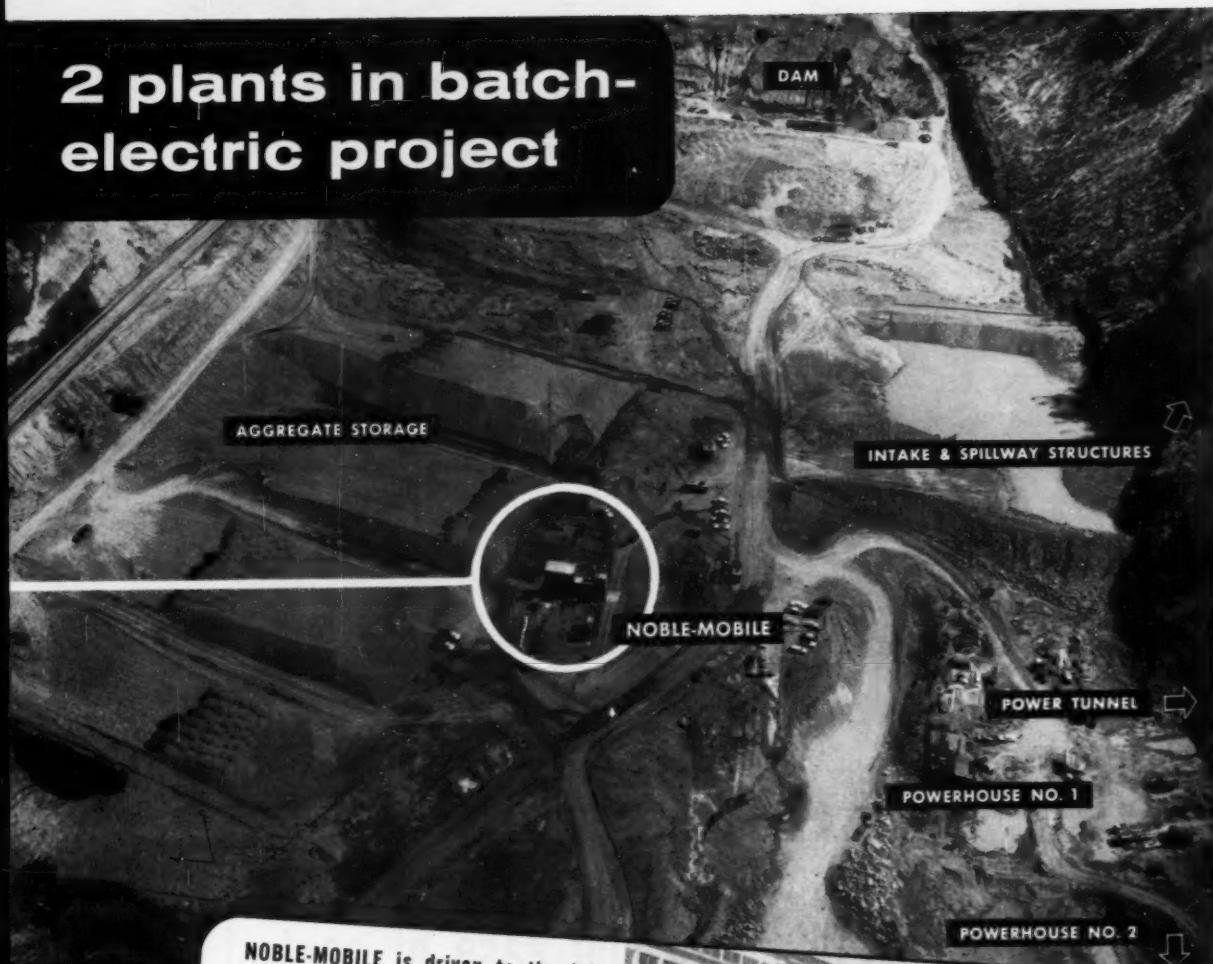
## **Pre-stressed piling manufacture at bridge site with NOBLE-MOBILE saves costly 25 mile haul**

In temporary set-up for manufacture of pre-stressed beams and pilings at construction of San Rafael-Richmond Bridge, California, NOBLE-MOBILE pays for itself from savings on erection and hauling. It is the fastest, most inexpensive batching plant to move in, set up, relocate.



Noble-Mobile above. Bridge photo at left.

## 2 plants in batch-electric project



**NOBLE-MOBILE** is driven to the job site and goes into production promptly. Produces dry batch, transit-mix or pre-mix for construction contractors, ready-mix producers or concrete products manufacturers. Aggregates may be loaded by crane, conveyor or scoop-loader. Bulk cement storage silo with truck or rail receiving hopper, unloading screw and vertical screw. Weighs aggregates and cement separately and simultaneously. Automatic or semi-automatic controls. No field wiring. Minimum erection cost. Purchase is easier to finance than stationary plant.



### NOBLE CONCRETE BATCHING PLANTS

WRITE FOR CIRCULAR

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Export Distributor, Frazer International Corp., San Francisco



Lima Type 1601 Shovel equipped with a 32-ft., 6-in. boom, 22-ft. dipper handle and 4-cu. yd. bucket. Shown loading shot limestone at junction of new U. S. 40 and Rt. 202 north of Dayton, Ohio. Owned and operated by Smalley Construction Corp., Celina, Ohio.

## LIMA speed, mobility and ease of control pay off for Smalley Construction Corp.

Smalley Construction Corp., Celina, Ohio, is one of the state's leading road and excavating contractors. At the present time the company is working on the relocation of U. S. 40 about 10 miles north of Dayton. This is a \$4,800,000 project and entails moving 1,400,000 yards of material and laying 20 miles of 2-lane pavement.

**Francis Smalley reports:** "To do the big digging jobs on this operation, we purchased a Lima Type 1601 Shovel equipped with torque converter in May, 1957. Since then we have been working it on two 8-hour shifts per day, and we have been averaging 5,000 yards of material per shift, which we think is very good."

**Tops in speed and mobility.** "One of the best features of the shovel is the speed of operation. It has a supercharged diesel engine and, with the torque converter, you get an amazingly fast, smooth digging cycle. We

also like the mobility of the shovel—both on the job and the way it knocks down for movement from job to job."

**Air controls are good feature.** "The air controls on the Lima make it easy to operate. This is an important feature, because it helps you keep your skilled operators, and they can do more work without fatigue."

**Gets good service.** "We've found that you get exceptional service when you buy Lima, both from the distributor and from the factory. This means a lot in our business."

Get the full story and you'll specify Lima for shovels (½ to 6-cu. yds.), cranes (to 110 tons), and draglines (variable). See your local distributor or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

**LIMA** Construction Equipment Division, Lima, Ohio  
**BALDWIN • LIMA • HAMILTON**

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment



# **Construction Methods**

AND  
EQUIPMENT

JANUARY, 1958

VOLUME 40 • NUMBER 1

HENRY T. PEREZ, Editor

## **Resolved...**

THE START of a new year traditionally is the time for good resolutions. "In 1958 we'll initiate that safety program we've been thinking about, so we can reduce our insurance costs. We'll really practice preventive maintenance on our machines, not keep putting it off. We'll overhaul our record keeping procedures so we can spot the profit leaks before it's too late. We'll not bid below our own costs, figured realistically." And so it goes.

Well, we'll bet that numerous contracting companies made those same resolutions at the start of 1957. At least 2,000 of these outfits, however, didn't keep their good resolves. Result? Failure.

This is indicated by Dun & Bradstreet's year-end figure of more than 2,000 contractor failures for '57—up some 17% over last year, and double the figure for 1952.

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Those are sobering statistics. To keep from becoming one of those statistics it would be well to examine your operations at all levels and in all departments. Make your New Years' resolutions—and keep them.

## **Men Who Build**

NEW YEARS is also an appropriate time for a fresh look at the industry we're in, and man's place in it. Edgar Kaiser, speaking at Pepperdine College after receiving an honorary Doctor of Laws degree, puts it this way:

"We take with us much more than the thing we call 'American know-how.' It isn't the world's biggest dams, it isn't the world's biggest bridges, it isn't the world's longest and widest highways. It isn't those material things. The thing we take with us—the key ingredient—is the will to build, the will to grow, the pleasure of the building itself, and the stimulation of inspiring others to build.

"We in the construction business have a deep conviction that work in the earth is not only satisfying but a way of life that makes man's progress possible. We are permitted to achieve success in its broadest meaning to leave the world and its people better off than we found them. No men walk more closely to the divine plan than those who build."



Lima Type 1601 Shovel equipped with a 32-ft., 6-in. boom, 22-ft. dipper handle and 4-cu. yd. bucket. Shown loading shot limestone at junction of new U. S. 40 and Rt. 202 north of Dayton, Ohio. Owned and operated by Smalley Construction Corp., Celina, Ohio.

## LIMA speed, mobility and ease of control pay off for Smalley Construction Corp.

Smalley Construction Corp., Celina, Ohio, is one of the state's leading road and excavating contractors. At the present time the company is working on the relocation of U. S. 40 about 10 miles north of Dayton. This is a \$4,800,000 project and entails moving 1,400,000 yards of material and laying 20 miles of 2-lane pavement.

**Francis Smalley reports:** "To do the big digging jobs on this operation, we purchased a Lima Type 1601 Shovel equipped with torque converter in May, 1957. Since then we have been working it on two 8-hour shifts per day, and we have been averaging 5,000 yards of material per shift, which we think is very good."

**Tops in speed and mobility.** "One of the best features of the shovel is the speed of operation. It has a supercharged diesel engine and, with the torque converter, you get an amazingly fast, smooth digging cycle. We

also like the mobility of the shovel—both on the job and the way it knocks down for movement from job to job."

**Air controls are good feature.** "The air controls on the Lima make it easy to operate. This is an important feature, because it helps you keep your skilled operators, and they can do more work without fatigue."

**Gets good service.** "We've found that you get exceptional service when you buy Lima, both from the distributor and from the factory. This means a lot in our business."

Get the full story and you'll specify Lima for shovels (½ to 6-cu. yds.), cranes (to 110 tons), and draglines (variable). See your local distributor or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

**LIMA** Construction Equipment Division, Lima, Ohio  
**BALDWIN • LIMA • HAMILTON**

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment



# **Construction Methods**

AND  
EQUIPMENT

JANUARY, 1958

VOLUME 40 • NUMBER 1

HENRY T. PEREZ, Editor

## **Resolved . . .**

THE START of a new year traditionally is the time for good resolutions. "In 1958 we'll initiate that safety program we've been thinking about, so we can reduce our insurance costs. We'll really practice preventive maintenance on our machines, not keep putting it off. We'll overhaul our record keeping procedures so we can spot the profit leaks before it's too late. We'll not bid below our own costs, figured realistically." And so it goes.

Well, we'll bet that numerous contracting companies made those same resolutions at the start of 1957. At least 2,000 of these outfits, however, didn't keep their good resolves. Result? Failure.

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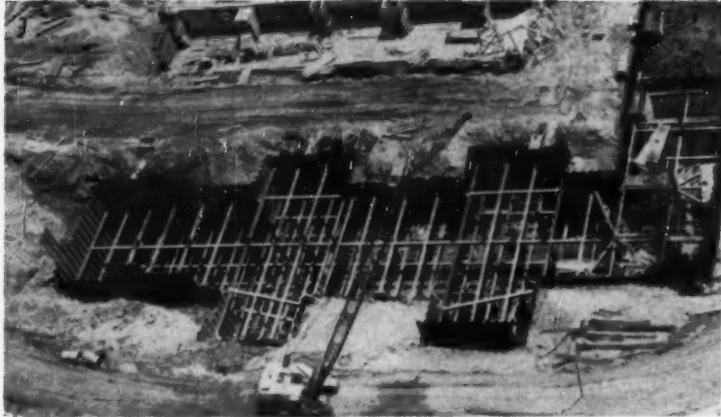


**EXCAVATING**—Clamshell can work at full speed to excavate this foundation because the unusual design of the cofferdam provides an unobstructed interior working area.

## Curved Wall Cofferdam Makes

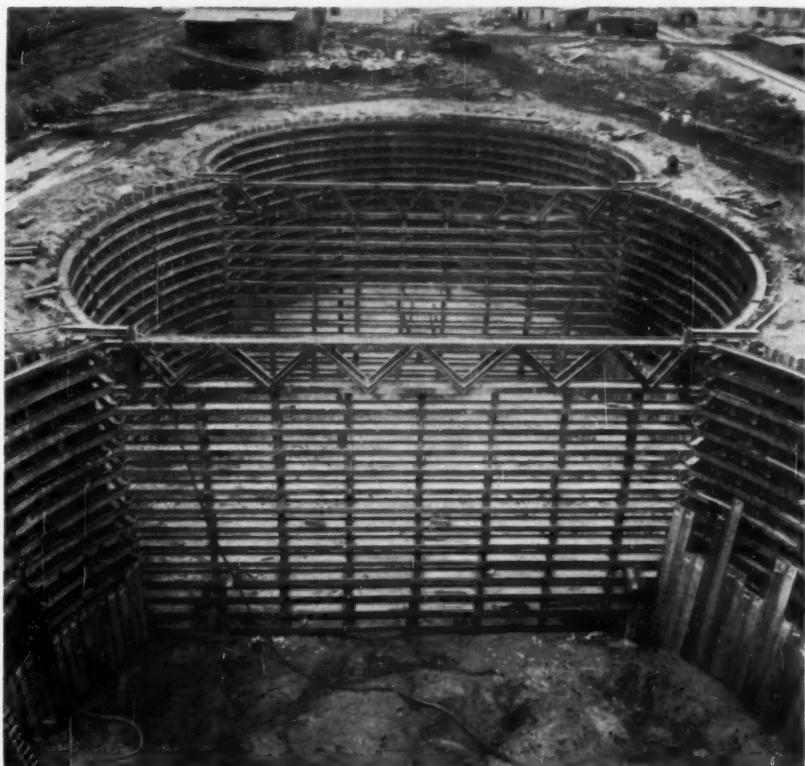
*Faced with two similar foundation jobs on the same site, this contractor tried two different types of cofferdam and found that a wide open, curved-wall structure gave the best results.*

## CHOICE OF COFFERDAMS



### STRAIGHT WALLS

Cofferdam for first foundation consists of sheet piles with considerable cross-bracing.



### CURVED WALLS

Wall of three intersecting circles needs only these two rows of steel struts for bracing.

## Excavation Simple

TO BUILD a 60-ft deep, rectangular foundation, a third of which is below water level, some kind of cofferdam is necessary. The only question is, what kind?

Gust K. Newberg Construction Co. of Chicago, Ill., held contracts to build two such foundations, and they built two entirely different cofferdams.

For the first foundation, they sunk a straight-walled cofferdam with sheet piling and extensive cross-bracing. This did the job, but, of course, there were the usual problems of excavating and concreting the deep foundation through the maze of cross bracing.

For the second job, Newberg decided it would pay to have a cofferdam that would leave working space unencumbered by cross bracing, and they built an unusual cofferdam with this in mind.

They sunk three large circular shafts that intersected one another a little so that the combined excavation formed a rough rectangle. It was more expensive to build than a straight-walled cofferdam but it left the interior wide open. And the resulting speed of excavation (with two 2-yd Bucyrus-Erie clamshells) and ease of pouring the foundation more than made up for the extra initial cost.

The job was part of the \$90-million, 600,000-kw power station that the Public Service Co. of Indiana is building on the Ohio River near New Albany, Ind.

The excavation had to be 60 ft deep, 210 ft long and 96 ft wide at the widest point. This involved removing about 37,000 cu yd of earth.

The only straight wall in the cofferdam is at one end where an existing concrete foundation wall provides the starting point for the new structure. The sides and other end consist of a series of arcs of steel sheet piling with curved wales, or ribs.

These arcs are the key to the clear cofferdam design because they can support themselves against the inward earth pressure. Cross-lot bracing is needed only at the points where two arcs meet.

This bracing consists of a wall of horizontal, H-beam struts across the excavation. There are two such walls, and they are the only bracing members within the excavation. The two walls divide it into three large sections.

### Ribbed Sheet Piling

Interlocking sheet piling, braced with specially designed curved ribs, forms the wall of the cofferdam.

Newberg found that in the type of soil they encountered they couldn't drive the piles the full

## CURVED WALL COFFERDAM ...

continued

60 ft without having them buckle. So they did it in two stages.

First, before the excavation started, they drove MP-116 sheet piling down 45 ft. A Bucyrus-Erie 38-B crane, with a 500-cfm compressor supplying air to a McKiernan-Terry No. 7 hammer, put them down the first 20 ft. A 9-B-3 hammer, powered by steam from a 100-hp boiler, drove them the remaining 25 ft.

The second stage was to drive MP-112 piling inside the first ring to bed rock at the 60-ft level. The inner piling started when excavation reached the 40-ft depth of the first wall, so there was a 5-ft overlap. It was 2 ft inside the outer ring to allow room for the hammer.

L. B. Foster Co. supplied the 560 tons of piling needed for the cofferdam on a rental basis. When this job is over Newberg will pull the piling, and it will be re-used elsewhere.

As the excavation went down, crews braced the piling with horizontal ribs at 2½-ft centers. Commercial Shearing & Stamping Co. of Youngstown, O., designed and fabricated the ribs from wide flange beams. They bent them accurately to the required arc by a patented progressive bending method that does not cause any buckling in the web.

The two larger shafts have 96-ft and 100-ft diameters, respectively, to the back of the ribs at the top of the excavation. The ribs in the top section of these shafts are 14WF53. In the bottom section they are 14WF48.

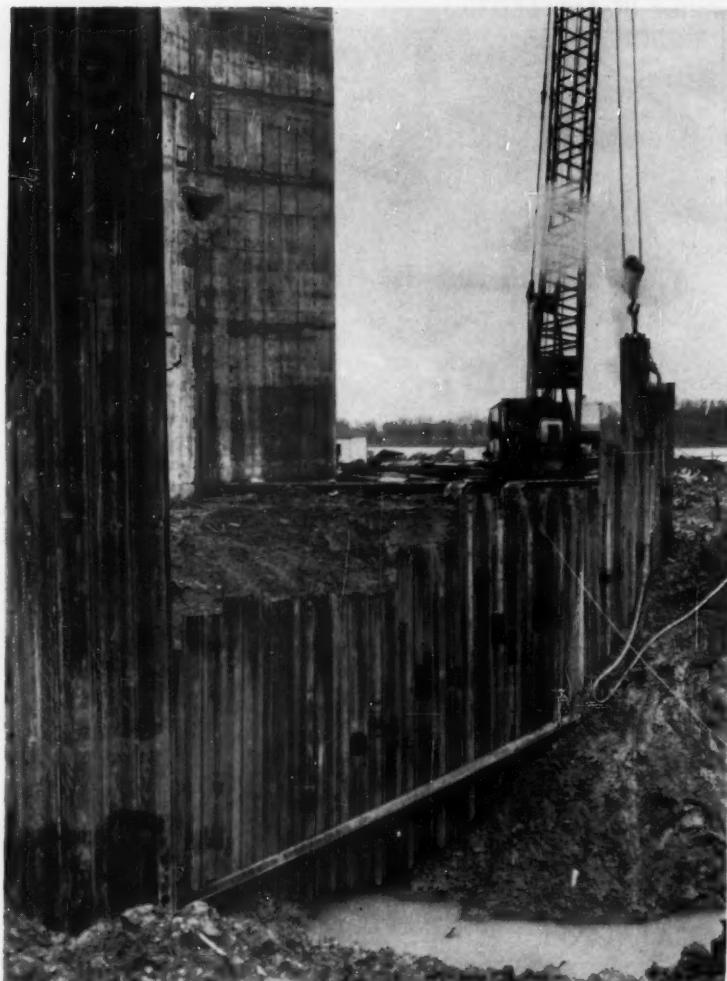
A smaller shaft at one end has an 84-ft diameter. In both sections of this shaft the ribs are 12WF50.

CS&S fabricated the ribs in short lengths with a 5/8-in. plate containing bolt holes welded to each end. All the field crews had to do was bolt the joints together, and the ribs formed a continuous ring around the shaft wall.

### Wall of Struts

The struts meet the ribs at the intersections of the wall arcs and so they, too, are spaced 2½ ft vertically. They are 24WF94 beams.

Since their main function is to resist compression from the walls



**TOP RING**—Pile driver puts down interlocking sheet piling to a depth of 45 ft to form outer ring of cofferdam. Two rings are necessary because of nature of ground.

they are set on their sides with their webs horizontal. In this position they can barely support their own weight over the 64-ft and 72-ft spans. So a 5-ft deep truss across the top of the excavation at each line of struts supports the struts under it.

The top and bottom chords of the truss are 24WF94 beams lying with their webs horizontal, the same as the struts. On each side of the truss are 6WF25 diagonal members. The truss diagonal members are set with their webs vertical. The inside flange is cut away at each end so that the web lies flat against the flange of the main chord. Connections are welded.

Beneath the truss are the horizontal struts. Each strut hangs from the one above it by ¾-in. round tie rods spaced at 8½-ft

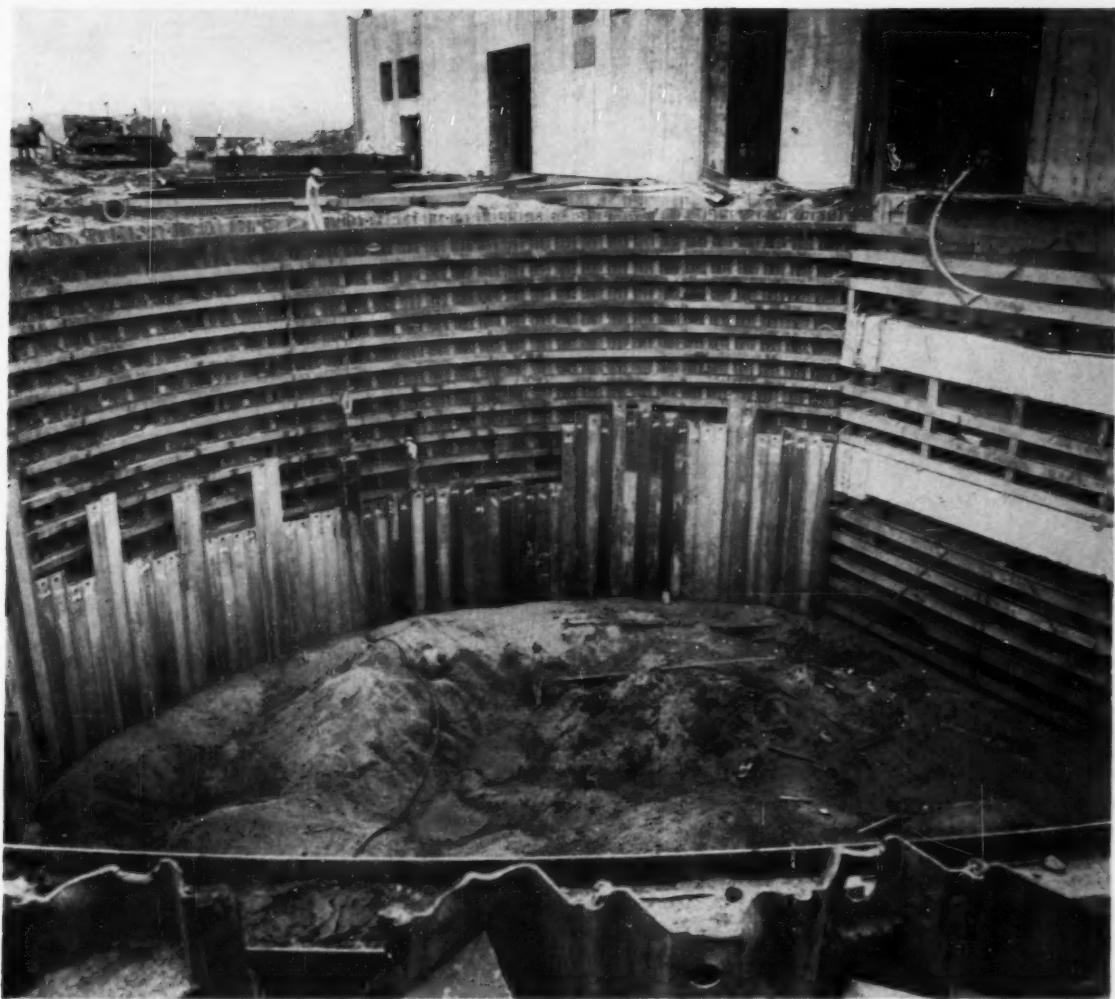
centers in groups of four. The tie rods are 2 ft 9 in. long with 3 in. at each end threaded. Blocks of 10x10-in. timber at 8½-ft centers separate the struts.

### Framing

The framing of the struts and truss into the ribs is similar to the rib connections. Steel plates welded to the ends of each member contain bolt holes to allow easy bolted connections to be made in the field.

Newberg fabricated both struts and trusses from designs by CS&S. The designer says the plans were drawn to utilize steel stock that the contractor had on hand and do not represent the optimum design for this type of structure.

The cofferdam was effective in keeping the excavation almost



**BOTTOM RING**—As excavation reaches 40-ft depth crews start a second ring of piling inside the first with a 5-ft overlap. Total depth of combined wall will be 60 ft.

completely free of water. Seepage was handled easily by a single 6-in. Gorman-Rupp pump working against a 60-ft head.

#### Results

Newberg was well satisfied with the performance of the cofferdam. "The cost of the ribs and struts compares favorably with the conventional lacework method," according to superintendent O. W. Simmon. "Reinforcement by a lacework of jacks and vertical and horizontal braces is an elaborate, time-consuming, and expensive operation. It was to eliminate this time waste and to eliminate the interference with excavation and pouring of concrete that CS&S and our engineers evolved the idea of the strut walls that has proven a very definite success."



**EASY DIGGING**—Tractor shovel at bottom of excavation piles material for clamshell. Cofferdam cost more than first one, but faster excavation and pouring are possible.



**NO ROOM ON THE GROUND**—Stiffleg derricks on garage roof put up first six floors of this building. Its boom now becomes a

gin pole to erect heavy girders. Rail-riding crane on eighth floor will erect upper 10 stories.

## Working Without Working Space

AN IMAGINATIVE COMBINATION of a crane, derrick, and gin pole by an Omaha, Neb., contractor turned an awkward building erection situation into a smooth, fast operation.

Western Engineering Company, steel erectors for a \$5-million addition to the Northern Natural Gas Company's headquarters in Omaha, found that working space at the site was severely restricted. And the structure's disproportionate length-width ratio of 152 by 56 ft would have required a lot of moving around for an ordinary derrick.

To get the erection started in the space available, Western bridged a neighboring building with a special platform for a 30-ton stiffleg derrick. The derrick erected the first six floors.

Then it lifted the superstructure of a 22½-ton Lorain truck crane onto the sixth floor and set it on rails running the length of the building. The rail-mounted

crane handled the remaining 10 floors, moving upward two floors at a time as it completed all the work it could reach.

At the seventh floor, five special 25-ton girders were too much for the crane to handle. So Western dismantled the derrick, set up its 130-ft boom as a gin pole and lifted the girders the seven floors.

### Derrick on Platform

Western ran into complications right from the beginning when they looked for working space around the new wing. The only clear ground was a narrow lane around three sides—not enough room for a derrick.

Next door was a one-story garage building that could not be razed. It was too light to support the derrick on its roof, so Western built a steel platform over the building to carry the derrick.

The platform consisted of two 80-ft long by 36-in. deep steel girders, mounted at right angles

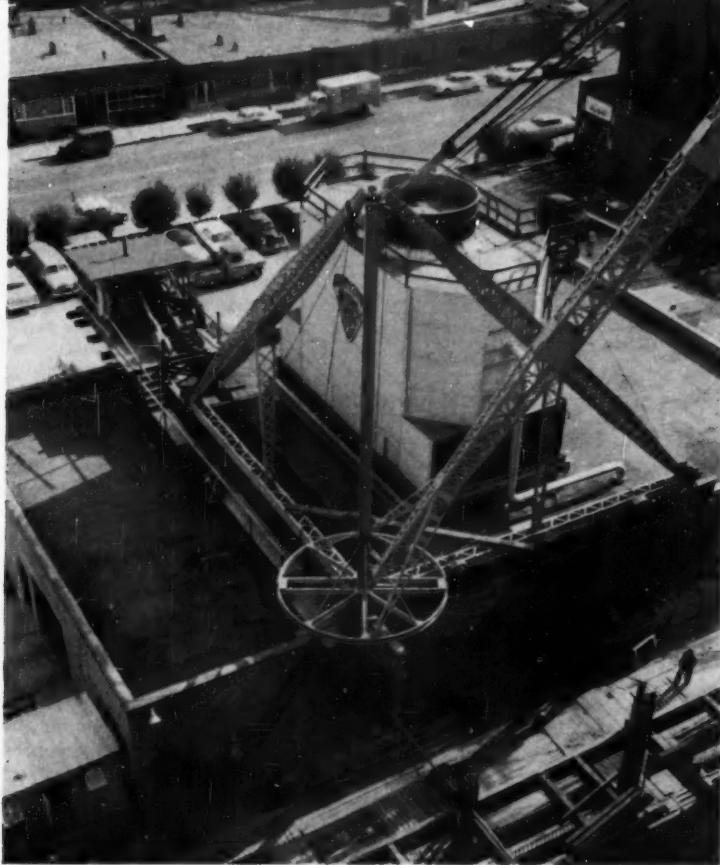
to each other to carry the derrick legs. One girder spanned the garage; the other ran beside an outside wall. Both girders stood on columns set into concrete bases.

The derrick itself had two 80-ft legs, a 130-ft boom and a capacity of 30 tons. It did three jobs; erected the first six stories, lifted the truck crane to the sixth floor to carry on the erection, and then became a gin pole derrick to handle the seventh floor girders.

### Gin Pole

The problem on the seventh floor was a 48x56-ft, six story existing wing that was to be incorporated into the new larger wing. It was not strong enough to support the 12 stories above it so it had to be bridged.

Five girders supported on columns outside the regular wall formed the bridge. Each girder was 65 ft long, 64 in. deep and weighed 25 tons. Western put



**DERRICK**—Because of limited space on the ground, the 30-ton stiffleg derrick has to be mounted on a specially built platform of H-beams above the next door garage.

them in place by a combined hoisting and skidding operation.

The first move was to complete the columns outside the existing wing. Temporary beams, bolted along the top of these columns formed the skidway.

The gin pole derrick, lifted the girders until they cleared the roof. Crews slackened off the guy wires, tilting the boom inward until it could place the girders on the improvised skidway.

It was then a simple matter for cable jacks to pull the girders into place. The farthest one had to go 56 ft, but they all slid easily on the well-greased skidway.

The five girders went up in a day and a half.

#### Truck Crane on Rails

The most unusual part of the job was the erection of framing for the top 12 floors by the rail-mounted truck crane.

At the beginning, Western officials were skeptical about such a radical technique. But when they got down to detail scheduling, it was apparent that this method would be the fastest.

*continued on next page*



**PLANNING**—Edward Foster, president of Western Engineering, demonstrates model that helped plan fastest erection methods.



**CRANE**—Standard 22½-ton Lorain truck crane is mounted on H-beam undercarriage that rides on rails. Crane erects two floors from this track, then moves up to next level.

## WORKING SPACE...

continued

The normal procedure of leapfrogging from floor to floor with a derrick would have required seven moves because of the length of the building. Western figured this would take 49 working days. The truck crane on the other hand moved upward only four times. The moves, plus initial setup and final removal, took only 10 working days.

The saving of 39 working days, or 60 calendar days, was more than enough to convince the skeptics. Time savings were especially significant since the time was late autumn, when weather was uncertain.

The crane was a standard 22½-ton Lorain truck crane, mounted on a specially built undercarriage. I-beams formed the main structure of the 20-ft wide, 16-ft long undercarriage.

The rig mounted four 10-in. double flanged wheels that rode on standard 90-lb rails, spaced 20 ft apart and running the length of the building. The rails were tack-welded to the transverse beams of the building which were at 8-ft centers.

These beams were adequate to carry the weight of the crane alone. When the machine was working, outriggers and screw jacks transmitted the stresses to the main columns which were at 28-ft centers.

One problem in setting up the

crane was the stub columns that projected 3 ft above each floor level. The undercarriage was built to ride 3 ft 2 in. above the floor to clear them.

The outriggers were retractable to enable them to get by the columns. This 4-ft retraction was also necessary to get the crane itself through the narrow bay to the next level.

The building was two bays wide and 8-10 bays long. The procedure in erecting a tier (two floors) was to set the rails along one row of bays so the crane could move freely along the length of the building to erect the bays on the opposite side. A manually operated Tirfor cable jack moved it along the rails.

Then it sat in the middle of the track and put up the bays on its own side until it had boxed itself in the center bay. With its 50-ft boom and 20-ft jib it could span the building from this position.

Normal erection time for a two-story tier was seven working days. Moving the crane assembly up 25 ft from one level to the next took a day and a half.

The first step in moving was for the crane to set the columns at the four corners of the bay directly above it. Then it put in the horizontal framing at the top.

Two temporary beams went across the horizontal beams to carry four Yale 10-ton chain hoists with cable slings. These hoists lifted the crane through eyes built into each corner of the undercarriage.

Two crews of nine men each operated the hoists manually. They spelled each other periodically during the 2 hr lift.

To allow the rig to rise through the floor, crews pushed the floor beams aside, sliding them in the flanges of the main beams with a small hoist. They replaced the floor beams after the crane went past and laid the rails on these same beams. Then they lowered the crane assembly onto the rails.

The fourteenth floor was the last stop for the crane. It completed the top two floors and the two-story penthouse from there with a longer jib.

A cantilever beam extending out from the fifteenth floor supported the tackle that lowered the crane to the ground after the job was finished. For lowering, the crane was dismantled into three pieces—the 7½-ton cab, 6½-ton undercarriage, and 5-ton counterweight.

During the entire erection the lack of space at the site prevented stockpiling of steel. The nearest available area was 16 blocks away through downtown Omaha.

This meant that steel deliveries to the site had to be timed so that only one truckload at a time arrived at the site. Cranes then picked the steel off the truck.

A Ross 15-ton straddle carrier handled normal-sized beams without interfering with city traffic. The big 25-ton girders arrived on the regular carrier of the Lorain crane up in the building, along with a police escort to help maneuver through traffic.

### Group Planning

Western developed the ideas for this erection by the so-called "brainstorming" technique.

When a job problem comes up, company executives sit down around a table and toss ideas into the discussion as fast as they can think of them.

Later the group goes over the ideas and analyzes them in detail. They often come up with an unusual but effective solution.

On this job the steel contract was awarded a year in advance. They used the time to build a plywood model of the building and experiment with erection techniques.

C. E. Van Severen was general superintendent for the company on this job. Frank Kissner was project superintendent. Western Engineering is a wholly-owned affiliate of Foster-Smetana Co.



LIFTING THE CRANE—Two nine-man crews, spelling each other periodically, take 2 hr to lift crane up two stories to next level with four manually operated chain hoists.



## Pipemobile Hauls, Places Heavy Pipe Sections

**Novel pipe-laying machine runs through a pipe section, picks it up, and hauls it along the trench into place.**

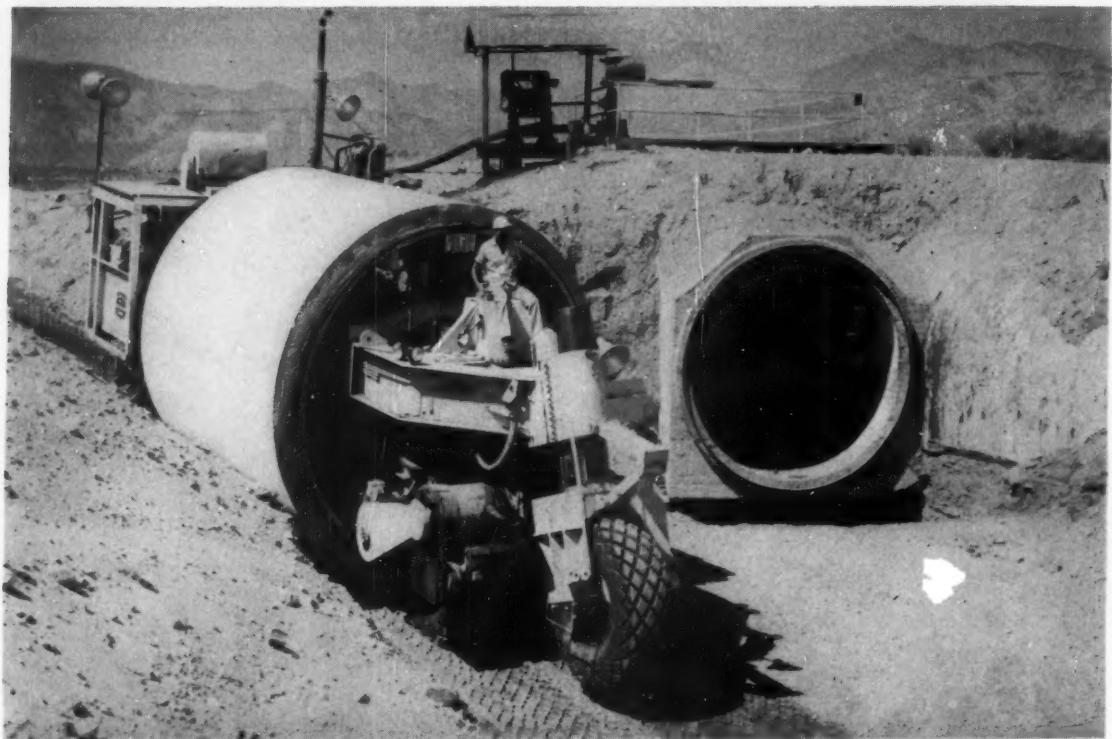
AN INGENIOUS RIG, called a "Pipemobile," is laying some of the heaviest precast concrete pipe in construction history to bring the Colorado River Aqueduct up to full capacity.

American Pipe and Construction Co. designed the Pipemobile to install 47 siphons totaling 12 miles in length along a 183-mi stretch of the aqueduct. The pipe is 13 and 13½ ft in dia, and each 16-ft section weighs 63 or 68 tons.

All of the longer siphons on the

Colorado River Aqueduct and some of the shorter ones are designed to be double barreled. But when the original construction was completed in 1941, only one barrel of each siphon, with appropriate bifurcation structures, was included. Now the Metropolitan Water District of Southern California is completing the second barrel of the siphons, long in advance of the 1980 target date, to meet water requirements.

*continued on next page*



### PIPEMOBILE . . . continued

American Pipe and Construction Co.'s two contracts, amounting to nearly \$16 million, impose a condition that led to development of the Pipemobile. The contracts specify that no load of any sort can be placed on the existing siphon barrels which parallel the new construction. That means that none of the trench excavation can be deposited on the existing siphons, no rigs can operate from that side of the excavation, and no loads can be hauled over them without bridging them over.

AP&C officials figure it would be impractical to try to work a pipe-laying crane from the same side of the ditch where the trench excavation was piled up. So they devised a way to place the pipe from within the trench.

The Pipemobile runs through a pipe section, picks it up, moves it into position, and seats the joint. It has two sets of front wheels arranged in tandem to permit it to enter a pipe section without damaging the steel joint ring. By transferring the load between the two sets of front wheels, the Pipemobile hops over the joint.

Ordinarily the single rubber-

tired front wheel carries no load. When the rig is carrying pipe, the double-tired second set of wheels carries the load.

To enter a pipe section, the rig is driven up until the single front wheel projects into the shell. Then this wheel is lowered to take the load, and the second set of wheels are retracted. When the rig has moved further into the pipe, load is transferred back to the second set of wheels. The process is repeated as the front end of the Pipemobile moves out of the pipe.

On the rear of the Pipemobile there are two sets of double wheels to provide stability for traveling and to carry the greater machinery load there.

Each set of wheels is powered by a 50-hp electric motor connected to the wheels through a gear reducer and chain drive. A 225-hp diesel engine driving a 250kva dc generator supplies power. Maximum speed of the rig is about 2½ mph. Changing the voltage output of the main generator adjusts the speed of travel.

Two operators ride the rig. The operator on the front end does

**INTO THE TRENCH**—Pipemobile carries 63-ton pipe section from storage area to final position and closes steel ring and rubber gasket joint. Rig weighs 80 tons.

most of the steering; the front wheels can turn through a 180-deg angle.

For major turns, the front end operator calls the main operator at the rear of the machine through an intercom system. The main operator can turn the rear wheels up to 30 deg in each direction. The main diesel engine drives a pump that supplies hydraulic power for steering.

The Pipemobile does not lift a pipe section simply by bearing against the arch of the pipe. Instead, the operators first extend hydraulically operated horizontal struts that exert pressure against the sides of the pipe. When these horizontal struts are firmly in position, vertical hydraulic rams lift the pipe off the ground. The horizontal and vertical rams also make the close adjustments that are necessary to seat the pipe joint.

Because the Pipemobile operates on the bottom of the trench, the pipe laying operation must proceed in sequence from one end of a siphon to the other. That means that some of the end sections must be placed on steep downhill slopes.



**UP A SLOPE**—A Cat D9 with torque converter and a D8 push the rig up a steep slope through a length of steel mast. Sling around pipe connects to crane's winch.

Laying pipe on downhill slopes as high as 30 deg presents two problems. The heavy pipe sections must be anchored in place as they are laid to keep them from sliding down the slope. And the Pipemobile needs additional power to climb the slope.

On slopes in excess of 10 deg, concrete blocks are dug into the bottom of the trench before pipe laying begins. After each section of pipe has been seated, but before the Pipemobile is removed, a 4x4x½-in. angle anchor is welded to a steel plate embedded in the concrete block.

One source of extra power is a winch powered by a 50-hp electric motor on the Pipemobile. This motor is in addition to the electric motors that drive the wheels.

When terrain permits, an anchor block is cast at the top of the slope. With a line around the anchor block, the Pipemobile can pull itself up the slope with its own winch.

But for steeper slopes, the Pipemobile needs the help of other heavy equipment. In some cases, a heavy tractor with a torque converter pushes the Pipemobile with a length of steel mast. In

addition, on some of the steepest slopes, a sling around the pipe is connected to a crane winch on top of the slope.

On the few slopes where ground conditions are so poor that the concrete anchors might not hold or the Pipemobile might not develop enough traction even with help, pipe is placed by rolling it on to rails and skidding it into position. This also is the way the contractor places the closing section at the end of a siphon where limited space prevents Pipemobile operation.

The contractor's schedule calls for casting and placing the big pipe sections at an average rate of 14 a day. When the Pipemobile must work on steep slopes, the rate is substantially less, particularly if the sections are the first in a siphon because extra care must be taken in aligning these sections. On some days the Pipemobile has placed only two sections. But on long flat stretches it has placed as many as 36 sections in a two-shift day.

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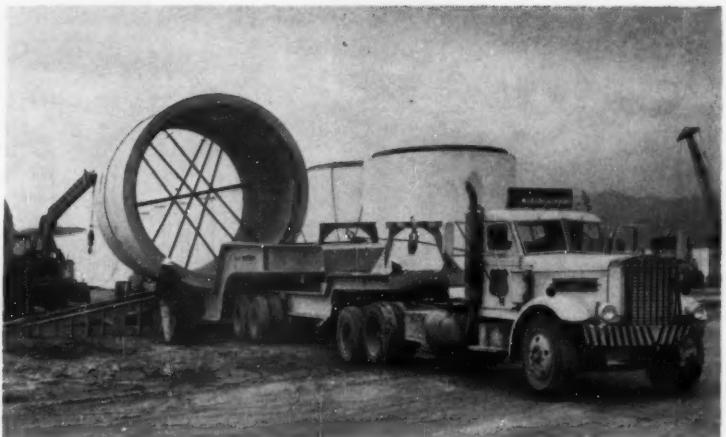
**ANCHORING THE PIPE**—Steel angle welded to a plate cast in a concrete block holds heavy pipe on steel slope. Concrete blocks are dug into trench on all 10-deg slopes.



**MAKING THE JOINT**—Workmen pour grout into the joint between two big pipe sections. Steel strapping holds Sisalkraft paper in place around the outside of the joint.

## Big Hauling Units With Winches Are Self-Loading

**LOADING**—A Gar Wood 80,000-lb winch on the truck-trailer pulls a heavy pipe section up a ramp on to the trailer. At storage area near ditch, winch will unload the pipe.



**HAULING**—Sterling tractor and specially built trailer loaded with pipe are too heavy for highway travel. Unit runs on special haul road along shoulder of highway.



**BACKFILLING**—American crane with an Esco 2½-yd bucket backfills over the pipe. Workmen sluice the granular fill as it is placed to develop the specified density.

Specially designed heavy duty truck-trailer units haul the pipe from the casting plant to storage areas at the site. These storage areas are leveled so that the Pipe-mobile can maneuver to pick up pipe sections. And they are connected to the pipe trench by an entry ramp. On long siphons they usually are spaced about  $\frac{1}{4}$  mi apart.

The truck-trailer units are equipped with heavy duty 40-ton winches to make them self-loading. The winches roll the heavy pipe sections up a ramp on to the trailers at the casting plant and reverse the procedure at the storage area.

The big hauling units are designed for later on-highway use. As a result they are 98 ft long to conform with regulations for load and axle spacing. But the pipe sections on this job are too big for on-highway transport so special roads must be built. In all, the contractor must build about 183 mi of access roads. But in some areas these roads are merely a widened shoulder of the state highway.

The project includes nearly 1,000,000 yd of excavation. Dragline cranes handle nearly all this work. Backfill also is a crane operation. Specifications require that backfill up to a grade 2 ft above the horizontal diameter of the pipe be consolidated to 70% relative density. This is accomplished by backfilling upgrade and sluicing the material as it is placed around the pipe. The fill material is granular and free draining so that the sluicing easily results in the required density.

*continued on page 70*

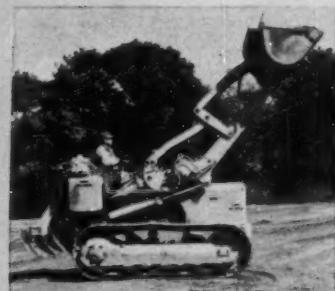
*Here*



*comes...*

*the TRAXCAVATOR'S*

*new...*



# SIDE DUMP BUCKET!

**—Directly interchangeable with standard bucket...same pins, bolts and nuts!**

**—Easy to operate! Dumps to the left as well as forward!**

Now the famed Cat-built No. 955 and No. 933 Traxcavators are more versatile than ever! The new Side Dump Bucket attachment gives you

- Higher production, because cycle time can be cut
- Lower maintenance, greatly reduced ground scuffing, because turning when loading is no longer necessary
- Easier handling because the unit now needs less space for loading and truck spotting.

And you retain all the regular Traxcavator's popular features. Lockout-kickout, bucket positioner, 40-degree tilt-back, one-hand bucket control. No interference, either, with other Traxcavator\* attachments when you equip with the new CAT\* Side Dump Bucket. Get complete details from your Caterpillar Dealer *now!*

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

# CATERPILLAR\*

\*Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

A NEW DIMENSION IN  
LOADER VERSATILITY

**Side Dump Buckets Available for the**

**No. 955 and No. 933 Traxcavators!**

	No. 955	No. 933
Bucket capacity	1½ cu. yd.	1½ cu. yd.
Overall width of bucket	96"	86½"
Overall height, side dump	17' 5½"	15' 6⅓"
Overall height, level	14' 6"	12' 11⅓"
Left side dump reach	24½"	25½"

**CUT EQUIPMENT DOWN-TIME**



*Lubricate with fast, custom-built*

# Alemite Portable Service Stations!

No engine oil wasted—delivers exact amount of oil required!

Fast, easy, high-pressure lubrication of all bearings equipped with hydraulic or button-head fittings!

Quick filling of final drives, gear housings, transmission!



# AND MAINTENANCE COSTS!



## 63% faster lubrication than hand gun methods!

Trucks, tractors—any heavy equipment—get in more “work hours” when you lubricate *on the job* with a fast, efficient Alemite power rig! For example, take a thousand pounds of grease—just a little over two full drums—and a relatively small amount for an average construction job. With Alemite power lubrication you can save 239 man-hours compared to hand methods—almost a six-man forty-hour week!

Bring modern lubrication to equipment in the field whenever and wherever you need it. Eliminate costly delays. End travel time to and from the grease shop. Reduce chance of costly bearing failures.

Here's how an outfit rigged especially for your needs can easily be selected from standard Alemite equipment: 1. You choose the truck that fits your needs for size, power, terrain. 2. A standard air compressor is installed. 3. Alemite Barrel Pumps are added to handle pressure gun and gear lubricants . . . motor oils. 4. A bank of Alemite hose reels are added. They cover a forty foot radius.



Air line equipment for on-the-job tire inflating, air cleaning!



## Mail Coupon Today for FREE Booklet!

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1850 Diversey Parkway, Chicago 14, Illinois

Gentlemen: Please send me your FREE illustrated catalog of Alemite Portable Service Stations.

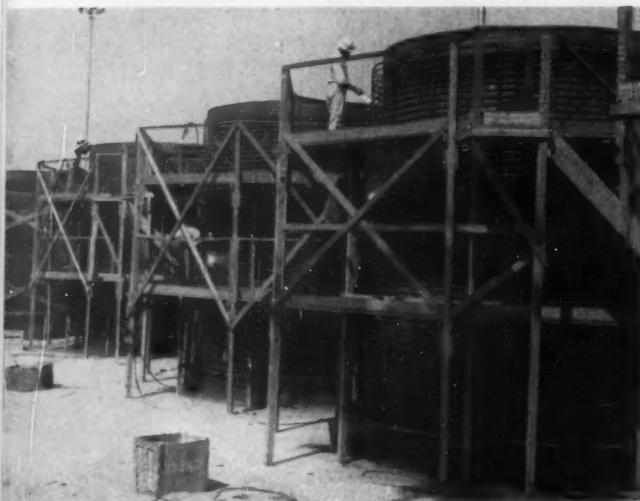
Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_





**REINFORCING**—Two cages make up the reinforcing assembly for each pipe section. Plant fabricates 14 assemblies in two shifts.



**FORMING**—American mobile crane sets steel form over reinforcing assembly. Workman rides lifting jig to unhook the form quickly.

## Efficient Plants Fabricate 4,000 Pipe Sections

The heavy pipe is cast in a plant built on rock fill to provide support for the work. A subcontractor supplies aggregate from a plant about 1 mi away.

Casting operations started June 15, 1957, and will terminate at the present location of the plant about the middle of this month. Then the plant will be moved 125 mi east. About 1,750 pipe sections will have been cast before the move; about 2,178 sections will be cast at the second location.

### Fabricating Cages

Reinforcing cages are fabricated in a yard at Etiwanda, about 80 mi from the present location of the casting plant. All of the reinforcing assemblies include an elliptical cage and either a cylindrical cage or a steel cylinder. The heaviest single cage weighs about 6,000 lb. The heaviest completed cage assembly (including the steel cylinder) weighs 6 tons.

The plant at Etiwanda has two cage machines. One is equipped with an elliptical mandrel for winding the elliptical cages. With both machines working two 8-hr shifts a day, the plant can turn out 14 complete cage assemblies, each consisting of two cages.

Reinforcing is  $\frac{1}{8}$ ,  $\frac{3}{8}$ , and  $\frac{5}{8}$ -in.

deformed bars supplied in coils with a maximum weight of 1,200 lb, then spliced and wrapped at the plant into coils weighing 8 to 10 tons. This minimizes the time the coil machines are down for a change of coils.

The cage machines are driven by electric motors through a series of gears. Coil spools also have a drive mechanism and a braking mechanism.

The combination of cylindrical and elliptical cages with relatively close tolerances makes fabrication of reinforcing cages a precise operation. Minimum concrete coverage for the bars is  $1\frac{1}{2}$  in. both inside and outside. Minimum clearance between inside cylindrical and outside elliptical cage is  $\frac{5}{8}$  in.

### Casting the Pipe

The pipe casting plant includes four sets of seven casting positions. It produces 14 sections a day with all casting done on the day shift. After casting the pipe sections get a 36-hr steam cure. Form stripping and setting crews come on the job at 2:30 am to strip the pipe cast the day before. By the time the casting crew arrives for the day shift, enough forms are set for casting to begin. Steam curing is interrupted long

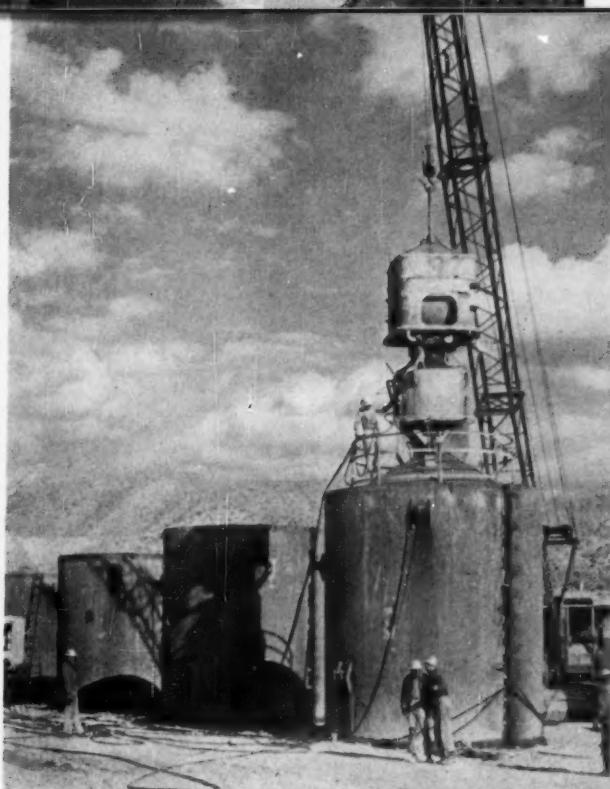
enough for the forms to be stripped, then the steam hoods are replaced.

On the second day, the pipe sections are removed from their casting rings and moved to a storage area. Curing is completed by spraying a membrane compound on the outside and water on the inside where membrane curing is not permitted.

A feature of the casting operation is the way the contractor moves the heavy pipe sections around the yard. A pair of the heaviest side-boom pipe-laying tractors team up to lift the pipe from the casting ring and move it to the storage area for final curing. After curing, the same tractors tip the pipe from vertical to horizontal position so it can be loaded for transport to the job.

Pipe casting is kept far enough ahead of pipe laying to provide an adequate inventory. But it should not run too far ahead because pipe in storage must be sprinkled with water.

There are no restrictions on the maximum ambient temperature at which pipe sections can be cast because as soon as casting is completed the pipe is steam cured. AP&C adds Plastiment admixture when the temperature gets about 82 deg to retard the set and make



**CONCRETING**—Hopper on concrete distributing cone has plunger to regulate flow of concrete from bucket down the cone into form.



**CURING**—Pipe sections are steam-cured for 36 hr. Dixon oil-burning boiler supplies steam to cure 28 sections at a time.

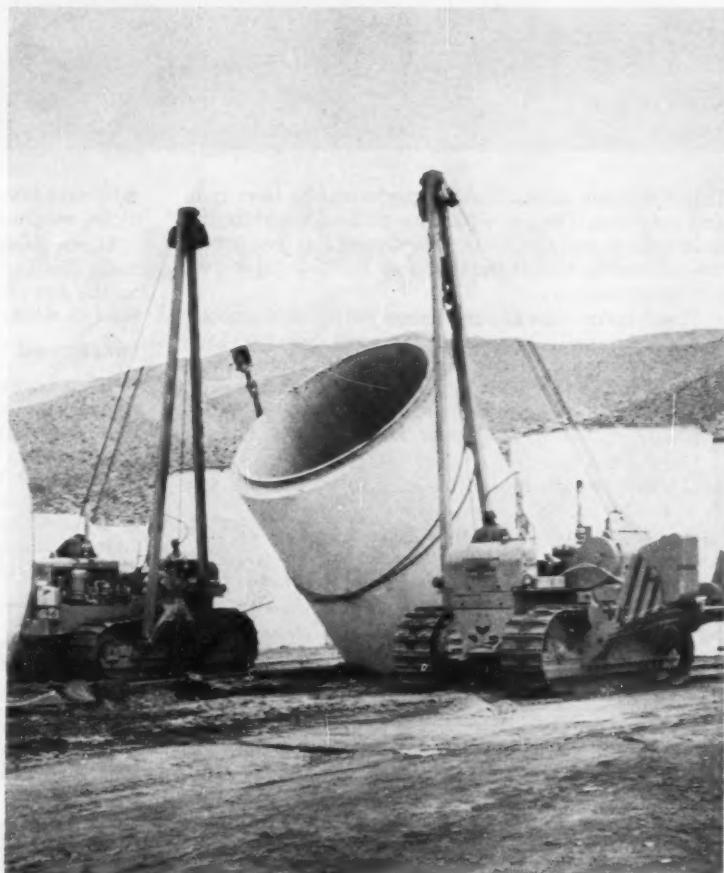
**HANDLING**—A pair of Caterpillar 583 side-boom tractors with Hyster winches move pipe sections around casting yard.

the concrete more workable. And during extremely hot weather, the concrete forms are hosed down and the aggregate piles sprinkled.

Schedule calls for all pipe casting to be completed by August 30, 1958, and the last of the pipe laying completed by October 30, 1958. The job is to be fully complete by the end of the year.

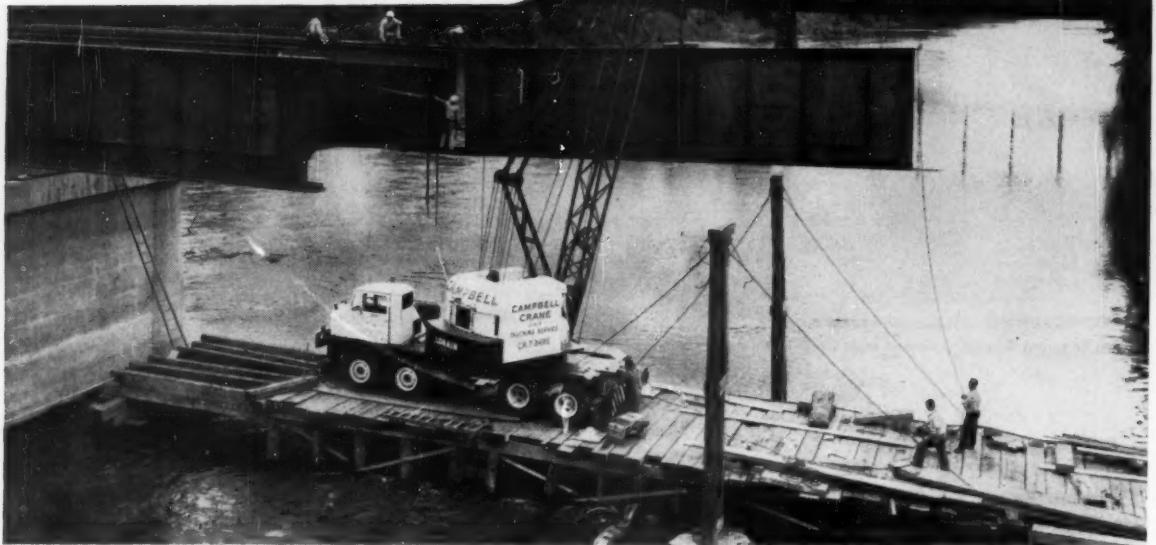
#### **Men on the Job**

Several officials of American Pipe and Construction Co. contributed to the development of the Pipemobile, including in particular A. G. Butler, chief mechanical engineer. O. M. "Chick" Hooper is project manager for AP&C. Clyde Grant is construction superintendent; Hugh Hofmann is pipe casting plant superintendent; Jack Johnson is reinforcing cage plant superintendent; and Jeff Fletcher is transportation superintendent.



# LORAIN MOTO-CRANE

## walks with... 19-ton girders



This operation called for top performance from men and machine. The job—pick up girders weighing up to 19 tons, travel them suspended over the rear out on the falsework and swing them in position on a new bridge structure.

These tasks were accomplished swiftly and smoothly by Campbell Crane and Trucking Service, Inc., Portland, Oregon, using a 35-ton Lorain Moto-Crane, model MC-530W, with 8 x 4 carrier, on the new Eugene-Springfield Bridge, which crosses the Willamette River. *Campbell owns 12 Lorains.*

Here are a few of the many features of this Lorain MC-530W which make this kind of profitable performance possible:

- The 8 x 4 carrier has four axles, mounted on front and rear bogies for improved weight distribution, better soft-ground flotation, better steerage. Both front axles steer.

- Three position turntable mounting—adjustable for (1) maximum crane capacities over the rear for lifting or traveling with loads, (2) for general purpose crane and clamshell service, and (3) for maximum digging ranges for dragline, shovel and hoe service.

- "Shear Ball" turntable mounting—no rollers, no center pin . . . completely sealed, no adjustment or lubrication problems.

- Square-tubular-boom—lighter and stronger—lifts more, reaches out farther and higher.

These are just a few important advantages that make the Lorain MC-530W an all-around performer on the big jobs. Ask your Thew-Lorain Distributor for the full story.

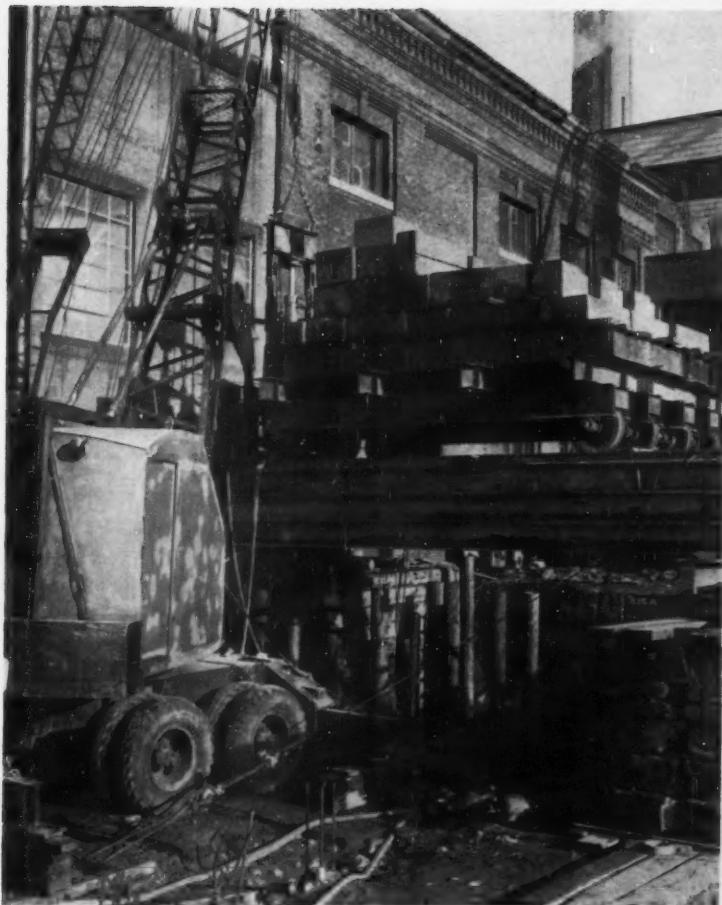
### Increased Capacities with "8 x 4" Carrier

On the Lorain Moto-Crane, model MC-530W, 8 x 4 carrier, there are no springs, front or rear. Both front and rear bogies are mounted on solid-walking beams. By removing front spring action, this exclusive, rigid design enables the 8 x 4 carrier to produce greater lifting capacities than three-axle carriers or ordinary 8 x 4 carriers with spring-mounted front axles. This feature alone puts the Lorain Moto-Crane, model MC-530W, in a class by itself. There's nothing like it.

ASK YOUR THEW-LORAIN DISTRIBUTOR ABOUT THE

**THE  
LORAIN**  
**MC-530W**

THE THEW SHOVEL CO., LORAIN, OHIO



**MOVABLE REACTION LOAD**—Cribbing built up of mud mats, gantry beams, and rolling load provides reaction for chain-type jacking setup for driving of pipe piles.

in the building were very close to the exterior walls.

After extensive vibration tests, engineers decided that driving piles within 20 ft of the existing walls could be dangerous. But the cost of excavating the water bearing sand and gravel or of building caissons figured to be prohibitive. So we decided to drive the piles in the danger area with hydraulic jacks.

Wescott & Mapes, engineers and architects on the job, designed 87 piles to carry 50-ton loads. These were to be placed adjacent to the turbine and boiler rooms. Specifications called for them to be driven to loads 50% greater than the design load.

To jack the piles, we built a special gantry reaction load against which a jack could push pipe piles into the ground. We erected the reaction load so that the greatest number of piles could be reached with a minimum movement of the driving equipment.

This is how we built up the reaction load. Timber mud mats 20 ft long were stacked to support the moving equipment. Over these we ran a line of oak rollers topped by steel beam sills. These carried a series of 14 WF95 beams 37 ft long to span pipe piles.

continued on page 76

## Jacking Piles Eliminates Shock

By C. E. MERTENTIME

Superintendent and Equipment Engineer  
Raymond Concrete Pile Co.

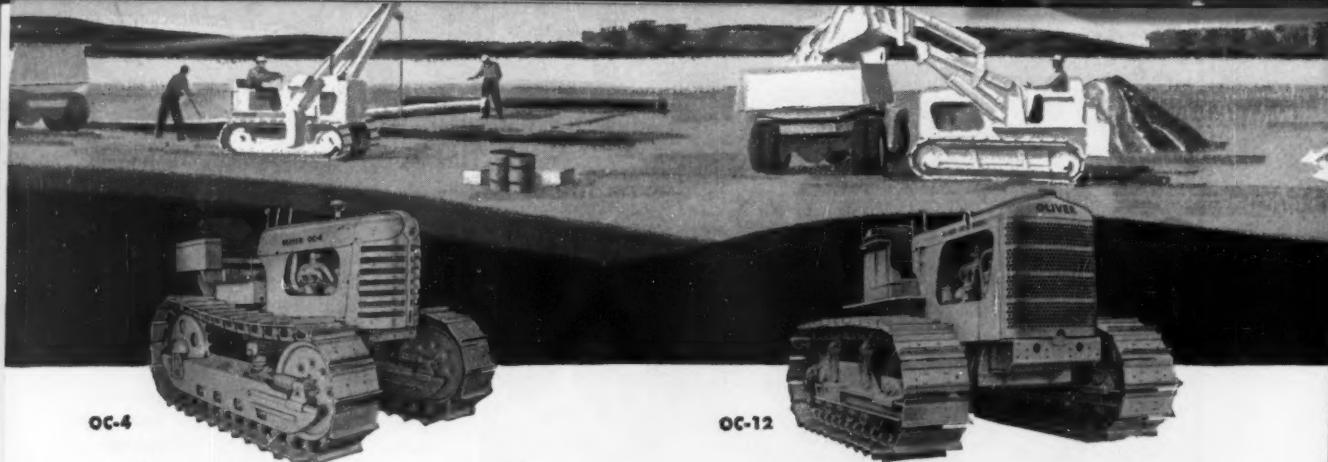
DRIVING open end piles with hydraulic jacks is a good way to take the shock out of pile driving when you have to.

Raymond Concrete Pile Co. used this unusual technique on a tough foundation job in Taunton, Mass., where we had to drive piles as close as 1 ft to a cracked building wall.

The project was an addition to the turbine and boiler rooms of the Taunton Municipal Lighting Co. plant. Existing foundations rested on spread footings that showed signs of serious settlement, and exterior masonry walls were cracked by the uneven settlement. In addition, the turbines



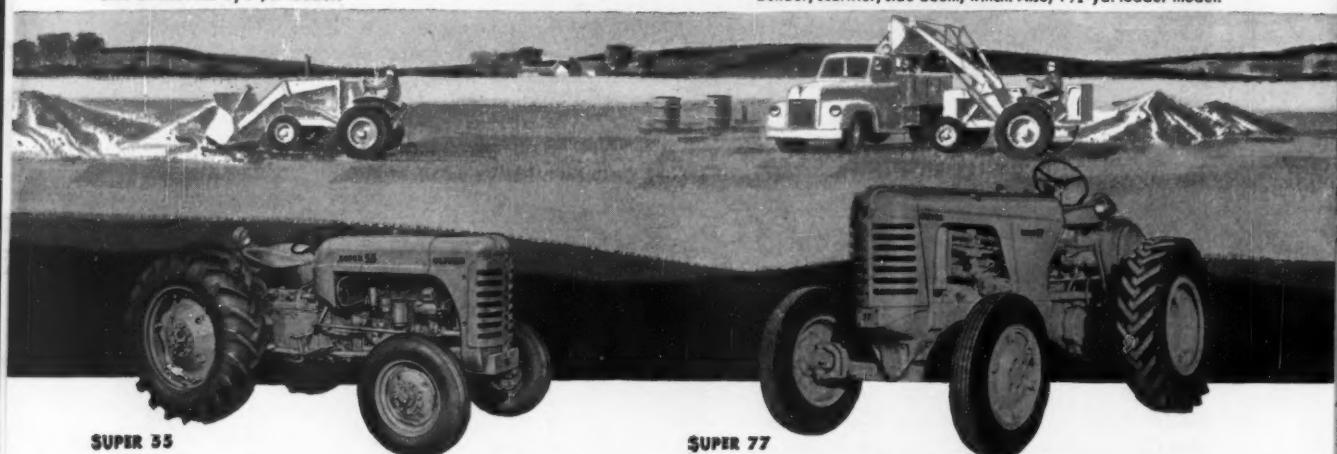
**PILE GOES DOWN**—Full-length pile edges into ground under force of hydraulic jack set into chain-type driver. Shockless driving can place piles within inches of damaged building.



**OC-4**  
—28 net engine h.p. Only crawler tractor in its class designed specifically for heavy construction work. Able, agile, versatile. Full allied equipment: dozer, trencher, backhoe, scraper, winch, side boom. Also 5/8-yd. loader.

**OC-12**

—62.8 gas or 61.4 diesel net engine h.p. The high performing, high efficiency crawler of long-run, low maintenance. Full-time working power on both tracks. Mounts dozer, trail-builder, scarifier, side boom, winch. Also, 1½-yd. loader model.



**SUPER 35**

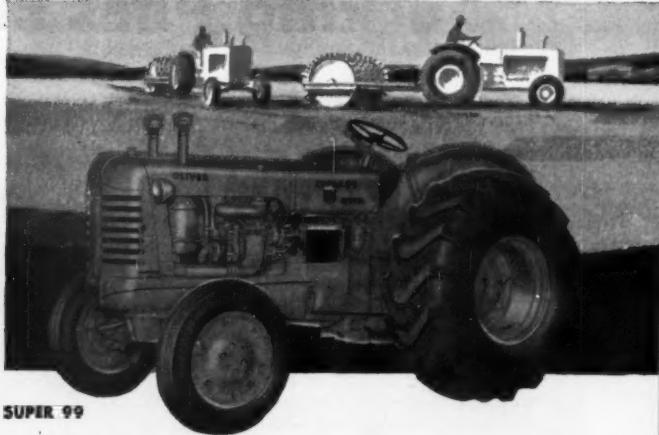
—39.1 gas or 37.0 diesel net engine h.p. Small investment gets you big income job range. Works with full line of front, side and three-point hitch attachments—dozer, 11-cu. ft. loader, trencher, fork lift, mower.

**SUPER 77**

—49.2 gas or 47.3 diesel net engine h.p. The high production rig in the popular, easy-handling size. Now with torque converter and Reverse-O-Matic for finger touch direction changes. Mounts 5/8-yd. loader, trencher, mower.

## PROFIT MARGIN PROTECTORS

Want it on crawlers or wheels? Either way you'll be work ahead with an Oliver tractor. As the biggest builder of both...Oliver is able to apply the advancements of one to the other. This has accelerated Oliver design—toughened Oliver construction—extended Oliver usefulness through a wider job range. You can do more with an Oliver—and stay at it longer. Start your margin of profit up—with the Oliver you need. On crawlers or wheels!



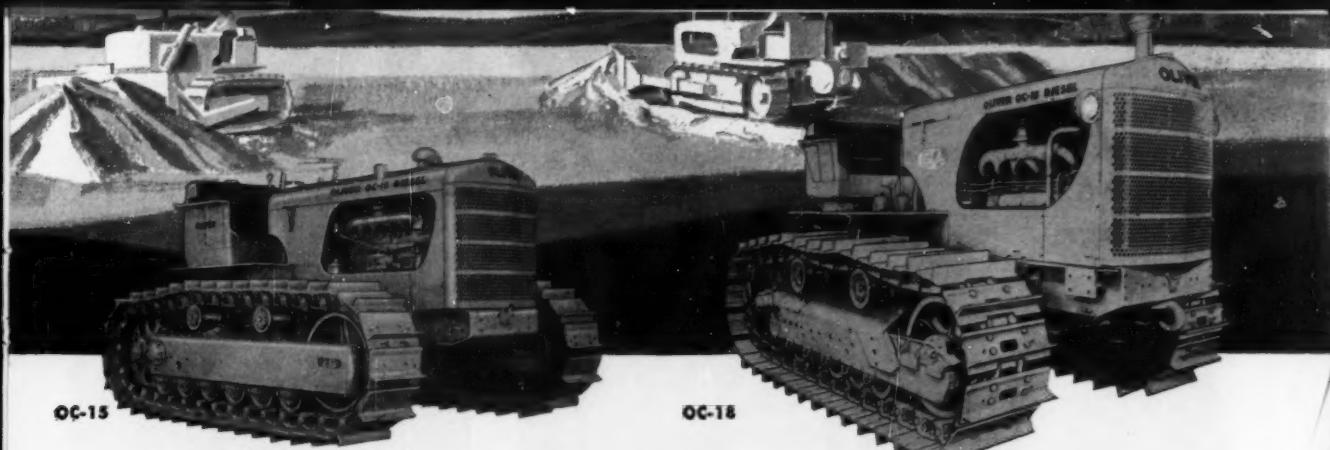
**SUPER 99**

—103 net engine h.p. Most powerful diesel wheel tractor of its type. For tough drawbar work. Light touch steering. Short turn radius. Torque converter available. Also 1½-yd. loader model.



**THE OLIVER CORPORATION**  
Industrial Sales Div., 19300 Euclid Ave., Cleveland 17, Ohio

**NOW...SEE YOUR EXPERIENCED  
OLIVER DISTRIBUTOR**



OC-15

OC-18

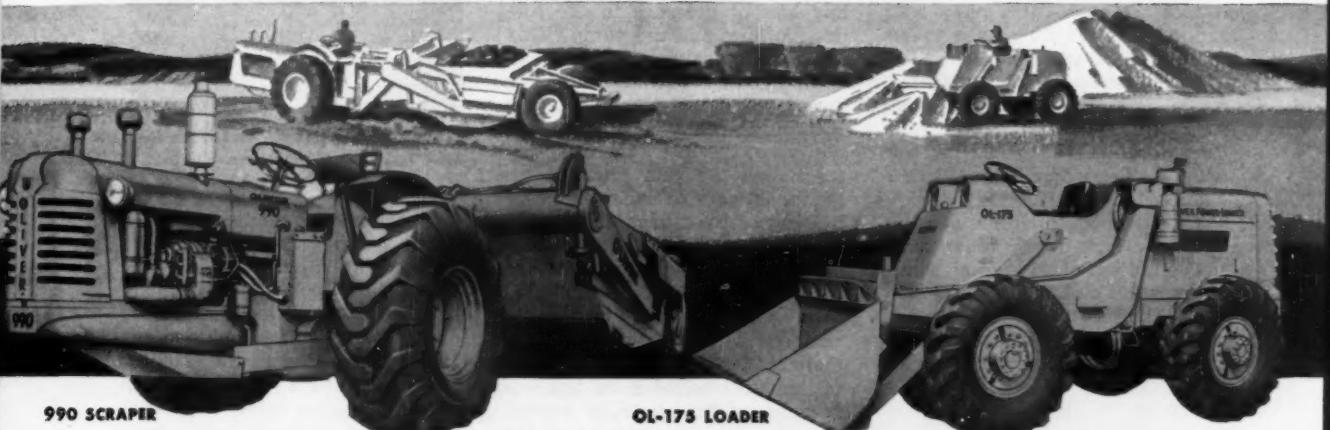
—110 net engine h.p. Newest design with greatest power to weight ratio of any tractor in its class! Two track turning power. Dozer, angleblade, scarifier, winch. 2½ yd. loader model also.

—161 net engine h.p. With famed Oliver POWER-TURN for spot turns with locked track or tight turns with both tracks powered—plus instant speed changes and drawbar pull without shifting. Dozer, angleblade, winch.



SUPER 88

—60.8 gas or 58.3 diesel net engine h.p. Nothing faster in its class for rapid cycle loading (3/4 yd.) or trenching (1/2 yd.)...or at any work you give it. Easy handling, wide travel speed range.



990 SCRAPER

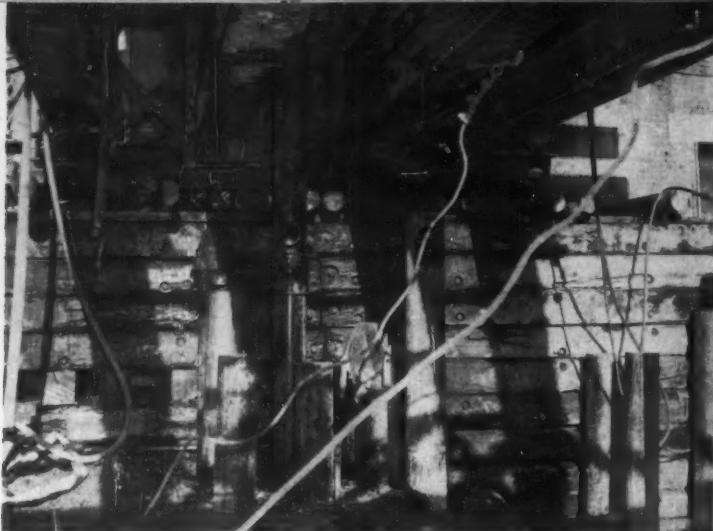
OL-175 LOADER

—6.7 yd. heaped capacity. Sized right and priced right for the small contractor who wants to profit from scraper economies...and also the big operator who needs versatile, clean-up and supplementary rig. All hydraulic. Torque converter available.

—109 gas or 133 diesel net engine h.p. Newest in the field—proved in the field. For loading, digging, clearing. New foot controls give fast forward-back travel changes with quick speed response. 4-wheel drive, torque converter. 1 ¾-yd. loader. Also dozer, other attachments.

# THIS YEAR TRIM YOUR COSTS with an **OLIVER '58!**

**You'll like your Oliver distributor's personalized sales and service. Whether your equipment needs are large or small, you can be sure of the kind of alert service that keeps your jobs on schedule.**



**FROM DOWN UNDER**—Pile follower (center) rams pile several feet beneath gantry level. Jetting helps ease passage of pile through sand and gravel bearing to desired depth.



**TAKING-UP LINKS**—During driving, workmen re-pin 2-ft links to shorten chain.

## JACKING PILES ELIMINATES SHOCK... continued from page 73

We then placed a rolling weight of 130 tons on top of the gantry beams to permit moving the reaction load directly up to the pile.

A special jacking frame held a long ram hydraulic jack. The load exerted on the pile was transferred from the jack through a head piece to two heavy link chains pinned to arms that straddled the gantry beams. Each link was 2 ft long. Actual jacking was done by a 150-ton double-acting hydraulic jack with a ram having a 30-in. stroke.

A 2-gpm, 10,000-psi gasoline-pump with a 15-gal reservoir activated the jack. The pump was equipped with a three-way valve that extended the ram, held it at a desired pressure, then retracted it. (A standard hydraulic test gage was installed on the ram that permitted the reading of the amount of pressure activated against the pile.)

We attached the pump to the hydraulic jack by an intake hose in the bottom of the cylinder and a return hose at the top. Diameter of the ram was 6½ in. and it took from 2 to 3 min. to extend it fully. The ram retracted under power in 1 min.

The piles we used were 10¾-in. black steel pipe, ¼-in. wall thickness with a 2-in. cutting edge welded to the bottom. Each measured approximately 26 ft in length and was placed under the hydraulic jacking equipment by crane.

The crane also handled jacking equipment. The jacking cylinder was suspended by the head piece.

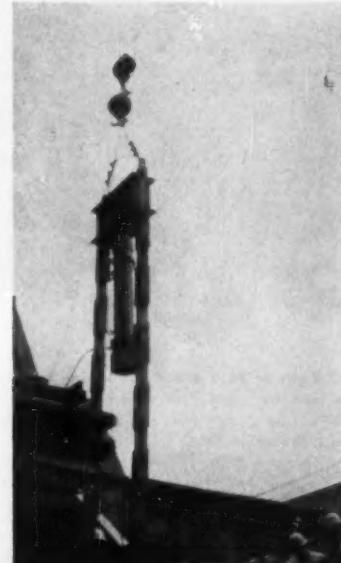
As the pile sank into the ground under jacking, a pair of links of the jacking reaction chains were taken up and the chain re-pinned. This continued for each stroke of the ram.

A pipe pile follower with an internal jet then was placed on the pile, and the pile was washed during the remaining jacking. The jet did not go below the tip of the pile, but the jetting method helped install the piles.

We placed a load of 75 tons on each pile after it had been jacked. We then put an additional 5-ton load on each to compensate for any loss of pressure in the hydraulic lines and the pump. This load of 80 tons was held for 5 to 10 min. If no settlement occurred, we placed a 1-ft tremie plug by bottom discharge bucket to the bottom of the pile. The next day we bailed the pile, checked for heave, and began concreting.

During the course of the job, a compression load test was conducted on one jacked pile. It had a total length of 25 ft and had been jacked to 80 tons, then cleaned. The load was reapplied and held for a 24-hr period. Gross settlement totalled ½ in. and was reached within a 10-hr period. For the remaining 14 hr of the 24-hr test period, no settlement occurred. After the load was removed, the pile rebounded ½ in. for a net settlement of zero.

We managed to drive a maximum of five piles per 8-hr shift to a minimum of one pile per shift. An average of 2 to 3 piles per shift were driven adjacent to



**SHOCKLESS DRIVER**—Truck crane helps move jacking mechanism from pile to pile.

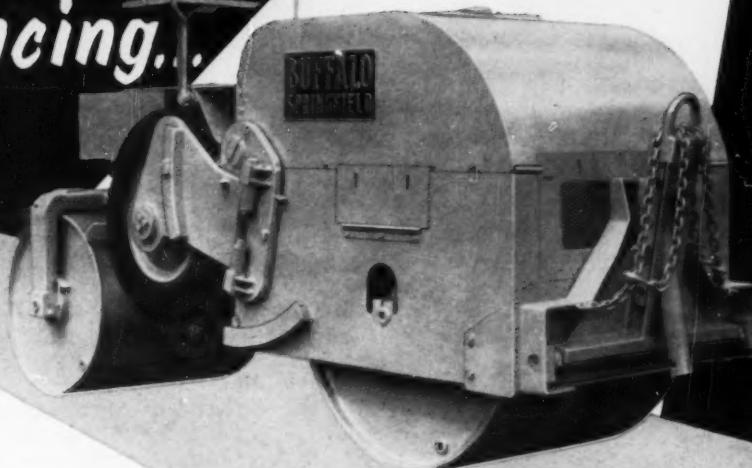
the turbine and boiler rooms.

The entire setup with units handled by a 25-ton Link-Belt truck crane, took four days to assemble. It permitted the driving of the jacked piles along one entire boiler room wall of the building. The turbine room jutted out from the boiler room creating a corner that required two setups.

Jacking crew consisted of a foreman and three piledrivermen on the jacking rig, plus one man on jetting. Jacking went on around the clock and was totally free of mechanical failure.

Francis Maxwell was project manager, Bob Holloway, general foreman. I was superintendent.

# Announcing...



## THE SENSATIONAL NEW 4-6 TON KT-8!

### ... MOST EFFICIENT PORTABLE TANDEM ROLLER MADE!

Hydraulically powered towing wheels "fold away" into the main frame to give the new 4-6 ton Buffalo-Springfield® Model KT-8 Portable Tandem Roller profit-making advantages never before offered in any other roller!

The KT-8's exclusive "fold away" feature permits maximum ground clearance . . . and completely eliminates excessive overhang! The KT-8 can work in tight corners . . . around obstacles . . . up against high curbs and forms . . . without removing the wheels. And the new "fold away" design lets the operator actually see his work at all times!

Hydraulically powered towing

wheels save time, save money—on every job. The KT-8 is ready for transporting in minutes . . . and ready to go to work just that fast at the next job site!

There are other profitable features, too. Torque converter drive automatically matches power to grade and material variations . . . permits infinitely variable speeds from 0.5 to 5.3 mph in either direction. Heavy-duty, high-speed, low-torque clutches provide smooth reversing without grabbing. Wide faced bevel gears assure long, trouble-free operation. *The KT-8 is built for maximum performance, dependability and durability in every respect!*

Buffalo-Springfield also offers a new 3-5 Ton Model KT-7A Portable Tandem Roller. The KT-7A does not include hydraulically powered towing wheels but offers towing attachment as optional equipment. The attachment includes towing hitch with hydraulic jack, stub axle assemblies with pneumatic-tired wheels, and wedge blocks.

\*Trademark Reg. U.S. Pat. Off.

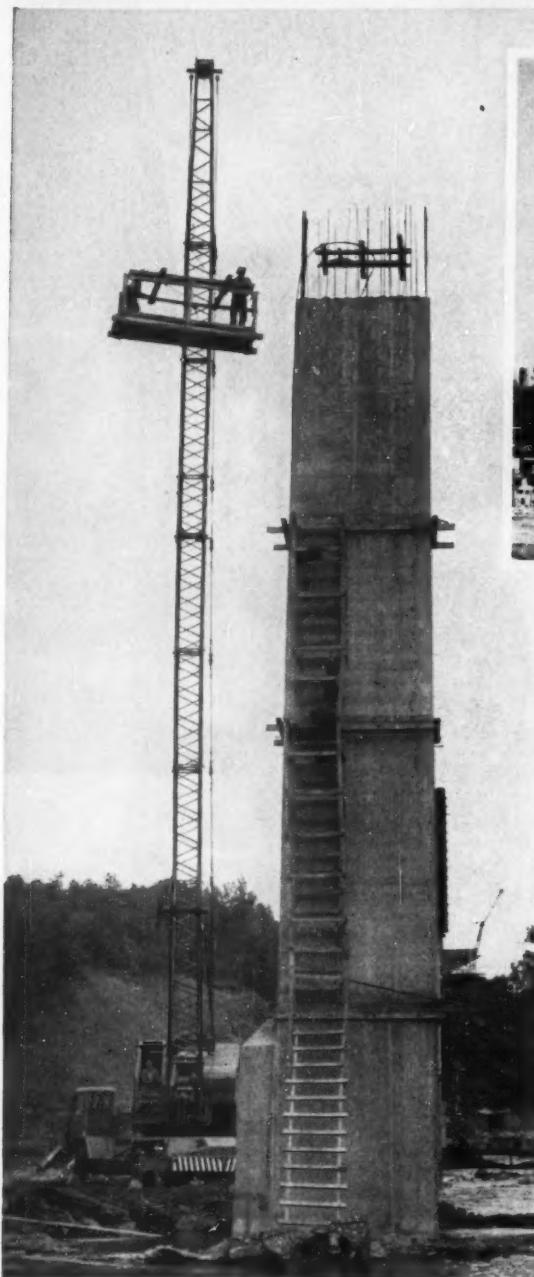
NEW, illustrated booklet gives complete information on the sensational new Model KT-8. Get it today from your Buffalo-Springfield Distributor or write direct.



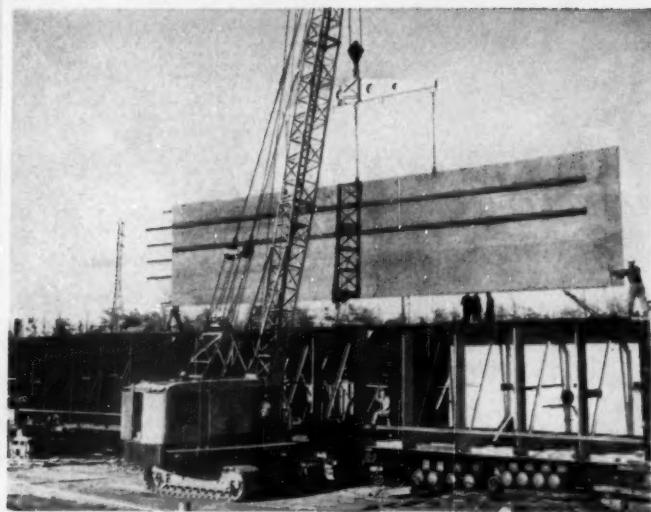
## BUFFALO-SPRINGFIELD ROLLER CO.

DIVISION OF KOEHRING COMPANY • SPRINGFIELD, OHIO

## KOEHRING WORK CAPACITY in action ...



**A long way up** — Building reinforced concrete piers for highway bridge, men and materials are hoisted to the top by a Koehring 305 truck crane, equipped with 90-foot boom. But that's not the limit of its reach. Truck-mounted 305 raises up to 100 feet of main boom, or 130-foot boom and jib with low A-frame! Butt-connected boom is safe, solid. Inserts are easily changed, only 2 bolts per corner. Check its lift capacities in chart.



**Barge-builder** — Large-section steel side-plates have to be hoisted and spotted in position for barge construction at this ship yard (above). It's an easy lift for the Koehring 605 crane. It has the power, strength and stability to safely lift up to 36 tons (on 50-foot boom). When extra reach is needed, the big 605 handles up to 110 feet of main boom — or 130-foot boom and jib.

### Here are some figures that will interest you:

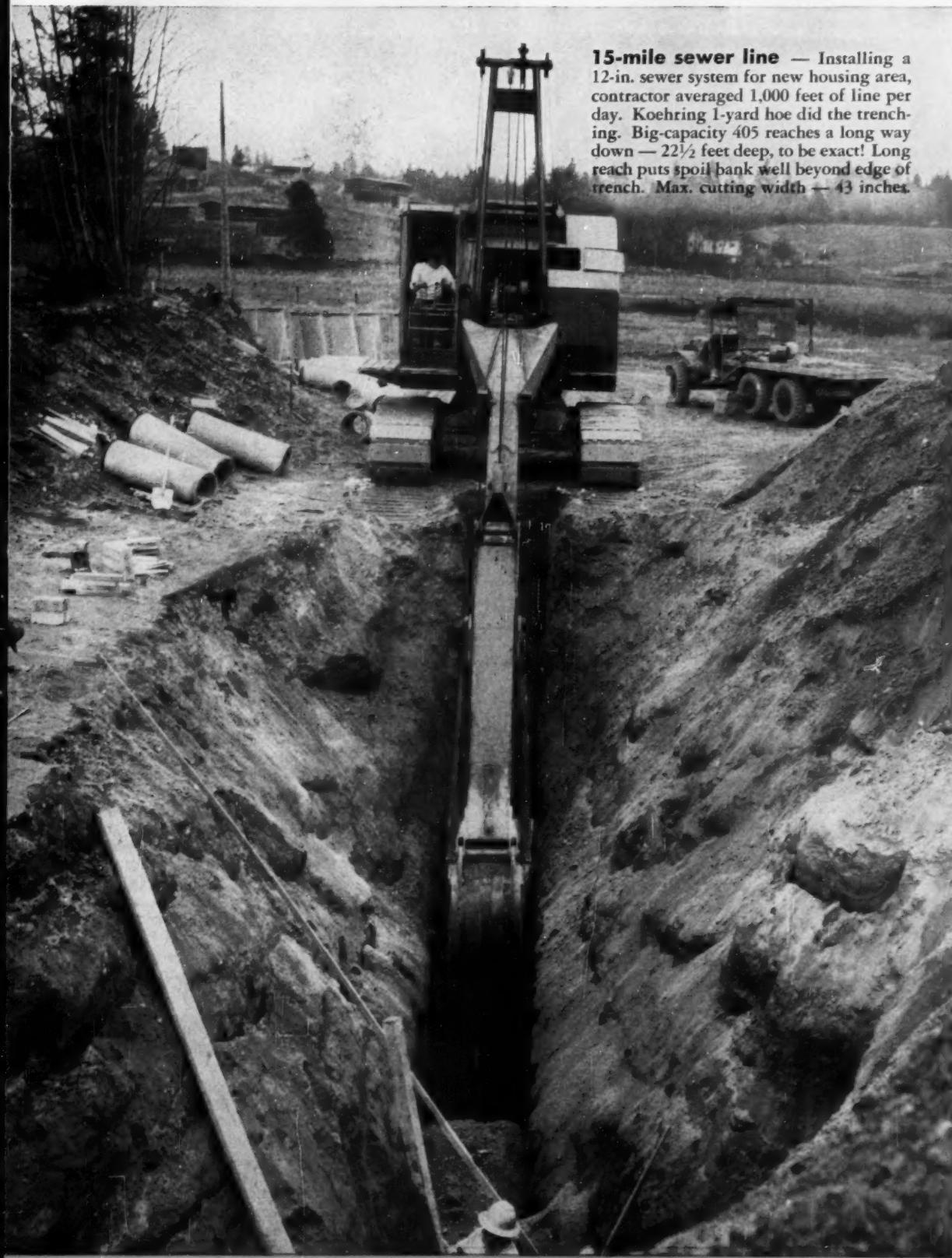
KOEHRING MODEL	SIZE DIPPER	LIFT CAPACITIES	
205 CRAWLER	½-Yd.	20,000 lbs.	at 10-ft. radius
205 ON RUBBER	½-Yd.	30,000 lbs. 14,600 lbs.	at 12-ft. radius at 20-ft. radius
305 CRAWLER	¾-Yd.	30,000 lbs.	at 12-ft. radius
305 ON RUBBER	¾-Yd.	50,000 lbs. 15,800 lbs.	at 10-ft. radius at 30-ft. radius
405 CRAWLER	1-Yd.	40,000 lbs.	at 12-ft. radius
445 ON RUBBER	(Crane only)	90,000 lbs. 40,000 lbs.	at 15 ft. radius at 25-ft. radius
605 CRAWLER	1½-Yds.	72,300 lbs.	at 12-ft. radius
805 CRAWLER	2-Yds.	104,200 lbs.	at 12-ft. radius
1205 CRAWLER	3-Yds.	190,000 lbs.	at 12-ft. radius

Want more information?

See Koehring distributor.



EXCAVATORS • CRANES • DUMPTORS® • PAVERS • FINISHERS • CONSTRUCTION MIXERS • MUD-JACKS®

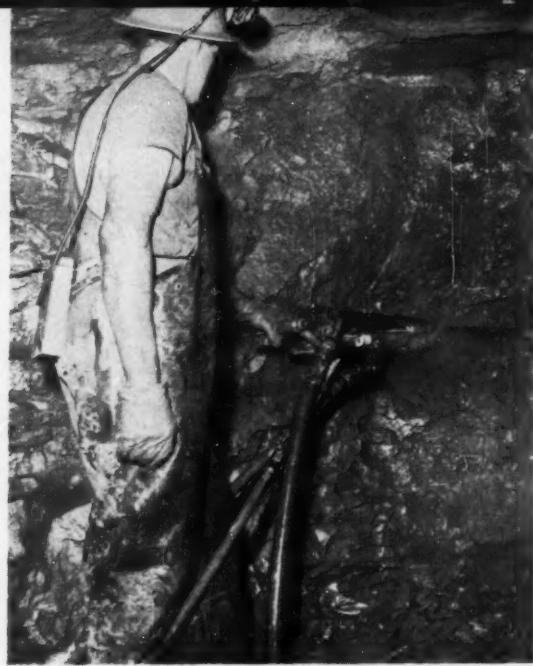


**15-mile sewer line** — Installing a 12-in. sewer system for new housing area, contractor averaged 1,000 feet of line per day. Koehring 1-yard hoe did the trenching. Big-capacity 405 reaches a long way down — 22½ feet deep, to be exact! Long reach puts spoil bank well beyond edge of trench. Max. cutting width — 43 inches.

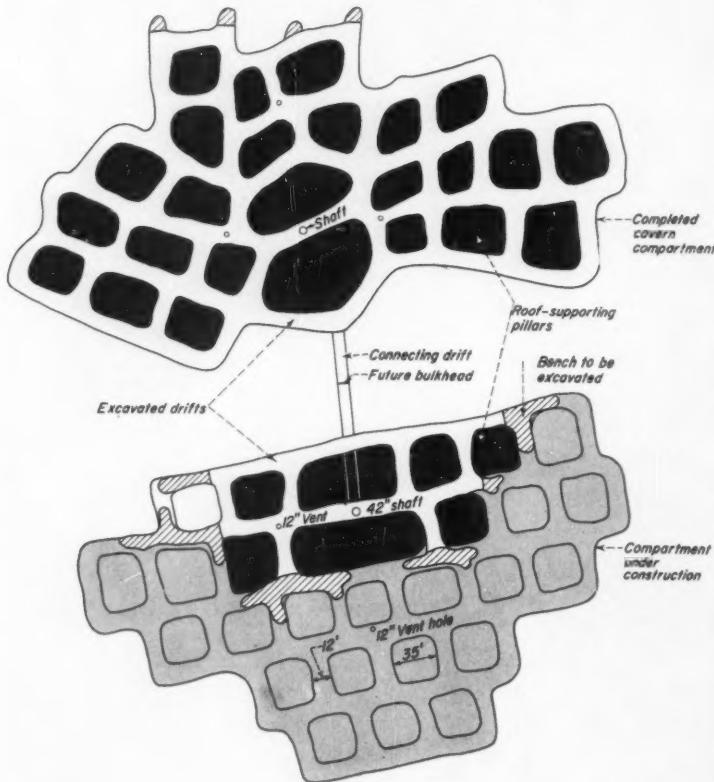
**KOEHRING** DIVISION OF KOEHRING COMPANY, Milwaukee 16, Wis.

K739

Crews excavate honeycombs in rock to build caverns for storing 675,000 bbl of liquefied gas. Men, muck, and even disassembled machinery travel in narrow 42-in. shafts more than 300 ft deep. Heading and bench methods tunnel around supporting pillars.



**DRILLING**—Ingersoll-Rand Jackleg drill sinks blast holes in shale at heading.



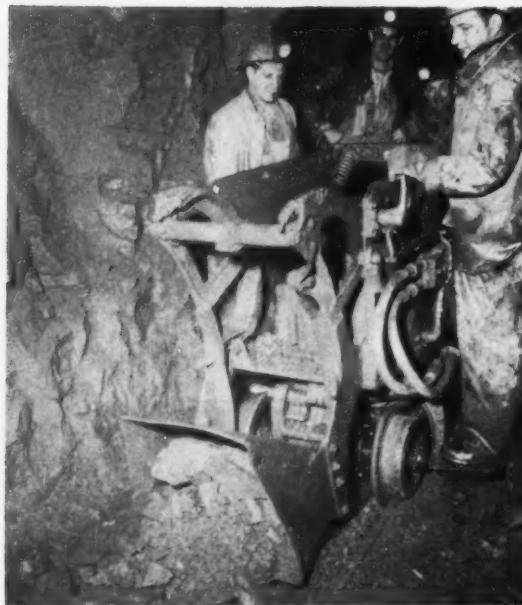
**HONEYCOMB**—One compartment of cavern is completed while another is excavated. Pillars are large because of poor strength of shale. In granite, they can be smaller.

## Mining

TUNNEL BUILDERS looking for new markets might take a long hard look at some recent developments in the petroleum industry. There is strong interest these days in the economies of underground storage of liquefied gas.

And there's good reason. The cost of underground storage is only a fraction of the cost of tank farms. In fact, a pair of caverns now underway at the Bayway Refinery of Esso Standard Oil Co. in Linden, N.J., will store a total of 675,000 bbl, the equivalent of more than 150 spherical tanks 35 ft in dia. Caverns are safe, require no maintenance, and occupy little valuable ground space at the refinery.

But building them is tricky business. Although similar to tunneling in many ways, cavern construction has some unique features. At the Esso plant, for instance, the Tulsa, Okla., firm of Fenix & Scisson, Inc., is mining a network of honeycombs in red shale more than 300 ft below ground. And all of the 140,000 yd of excavation is handled through shafts small enough to amaze the most seasoned tunnel stiff. Men, muck, and machinery all travel in a bucket that barely



**MUCKING**—Eimco 21 loads muck into 1-ton bucket, pushes it on car to shaft bottom.



**LOADING**—Empty is pulled aside as hoist prepares to lift muck at 2,200 fpm.

## Caverns Through Small Shafts

fits inside a 42-in. pipe shaft. Yet, the contractor can work seven crews from a single shaft and remove up to 300 yds of muck in a 9-hr shift.

Esso engineers specified small shafts for two reasons—they can be drilled more cheaply than a conventional shaft can be sunk. And even more importantly, they will be simpler to seal and cap later. Capping is necessary because both caverns will be operated constantly under pressures as high as 110 psi to keep the gas liquefied.

In both caverns, the room and pillar method of single-level mining is followed. Roof-supporting pillars are 35 ft square and 45 ft on centers. The surrounding excavated drifts are trapezoidal in cross section—12 ft at the base, 10 ft at top, and 22 ft high. One cavern for storing 300,000 bbl of propane has two 300x200-ft compartments connected by a drift; the other cavern, for storing 375,000 bbl of butane, consists of three 200x200-ft compartments in a row, connected by drifts.

The first big job was drilling five 52-in. dia holes for the 339-ft shafts. And it proved to be the

toughest problem in the entire cavern-building operation. Actually, few if any holes of such size and depth had ever been drilled before. And it took a specialist like Layne-New York Co., Inc. to do the job.

Layne experimented with a number of devices before they were satisfied. The big problem was keeping the bit plumb. The shale was not uniform, and there was a strong tendency for the drilling to go out of line.

Eventually, Layne developed the right combination of devices to do the job. They first drove a 17-in. pilot hole the full depth of the shaft. Then they followed this with a huge multiple roller bit that completed the 52-in. hole. Designed and built especially for the job, the big bit consisted of five rings of Reed and Hughes roller bits. The leading roller group cut a 17½-in. hole, and succeeding groups increased the dia to 52 in. Resembling an inverted Christmas tree, the big bit was operated by a standard oil-field derrick.

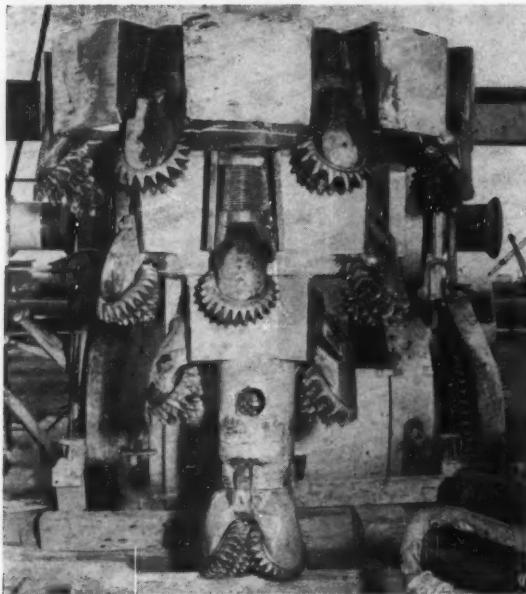
Drilled particles were removed from the hole by a reverse circulating method. Layne felt that the hole was too large to use the

normal method of pumping drilling mud down through the hollow drill shaft to carry the particles up on the outside. Instead, they pumped the natural infiltrating water up through the shaft, which carried the particles and eliminated the need for mud. The system could accommodate stones up to 6 in. in dia.

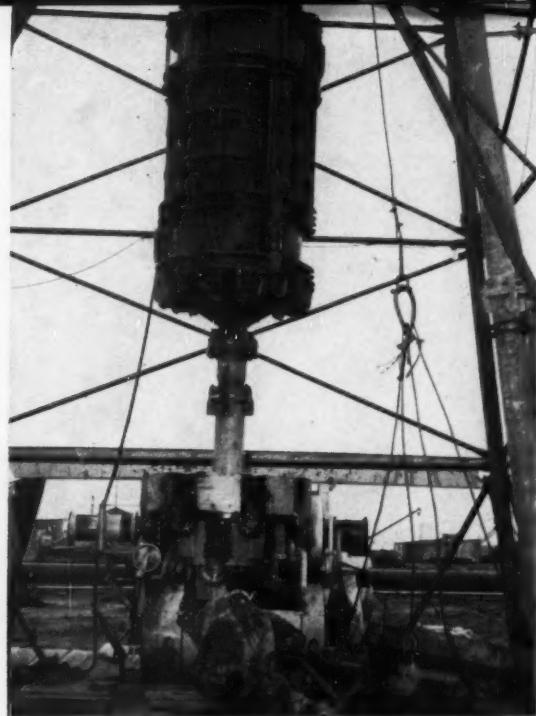
But the bit cannot get all the credit for fast and accurate drilling. A cylindrical guide that followed the bit by about 15 ft was a big factor in keeping the bit plumb. It rotated inside the previously drilled hole, locking the bit in position and also smoothing the surface of the hole with roller bits. Average production was about 10 ft of 52-in. hole per shift.

When the hole was completed, sand was dumped in to fill the bottom 28 ft and provide a temporary foundation for the 42-in. dia steel casing. Handled by the derrick in 20-ft lengths, the 5¾-in.-wall pipe was placed by controlling its buoyancy in the water-filled hole. By plugging the end of the pipe, and pumping water back and forth between the outside and inside of the pipe, the casing was lowered as subsequent

## MINING CAVERNS ... continued



**MULTIPLE BIT**—Four levels of roller bits mounted on rings of increasing dia cut 52-in. hole for one of caverns' main shafts.



**GUIDE**—Following closely behind bit is large reamer that smooths surface of hole and also helps keep drilling on line.



**SETTING CASING**—Oil field type derrick lowers section of 42-in. pipe into hole.

sections were welded to the top. When the bottom of the pipe landed on the sand base, it was plumbed, then grouted in place by three pipelines that were raised slowly from the bottom to the top of the pipe.

After grouting, the concrete plug in the pipe was removed with a drill and the sand foundation excavated by a conventional caisson bailer. At this point the men were ready to go down and start the cavern.

Progress was slow at the start. Working with jackhammers, only a few men could operate at a time. They broke out a work area and loaded muck by hand into small buckets. As the cavern enlarged, more men could work, and soon several crews were pushing drifts in different directions.

The first machines to go down the small shaft were two Eimco 21 muckers. Working on short lengths of track near the shaft, they loaded directly into 1-ton buckets set on cars, which they moved back and forth to the shaft. However, as excavation moved away from the shaft, Allis-Chalmers HD-6 front-end shovels were brought down to handle the longer hauls.

This was no easy task. The tractors had to be broken into relatively small pieces to get them down the 42-in. shaft. Tracks

were removed, buckets and frames were cut in half, engines were stripped, and many other parts were dismantled. At the bottom of the shaft, they were reassembled. With the aid of the hoist on top, crews put together each tractor in about two shifts.

Before the job is over, at least five tractors will go through this process. And, because the two caverns are not connected, most of them will probably go through it twice.

To excavate the trapezoidal drifts, the contractor follows the heading and bench method of drilling and blasting. The upper third of the face is removed first, always about 25 ft ahead of the bench. Equipped with Ingersoll-Rand Jackleg drills, crews sink about 22 holes 10 ft deep into the face. Because of the abrasive character of the rock, the 1½-in. Jackbits are faced with carbide inserts.

Although the drilling pattern varies with the condition of the rock, a five-hole burn cut is most common. The center hole is not loaded, and the four surrounding holes are drilled as a modified pyramid cut. With eight 1-sec delays, they pull 9½ ft.

The 16-ft high bench is attacked in such a way that it always retains the shape of a ramp, permitting the tractor shovel to

# **IMPORTANT NEWS!**

## **HERCULES TO MAKE LYCOMING-DESIGN ENGINES**

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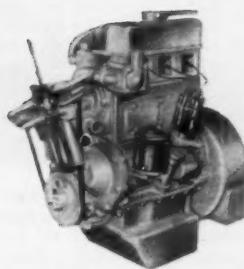
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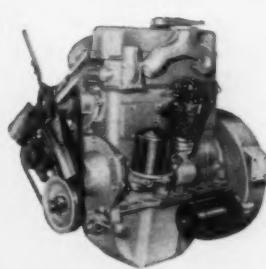
Lycoming-Design Hercules Two Cylinder Air-Cooled Industrial Gasoline Engine, Displacement 88 cu. in.



Hercules Three Cylinder Water-Cooled Gasoline (or Diesel) Engine, Displacement 130-149-169 cu. in.



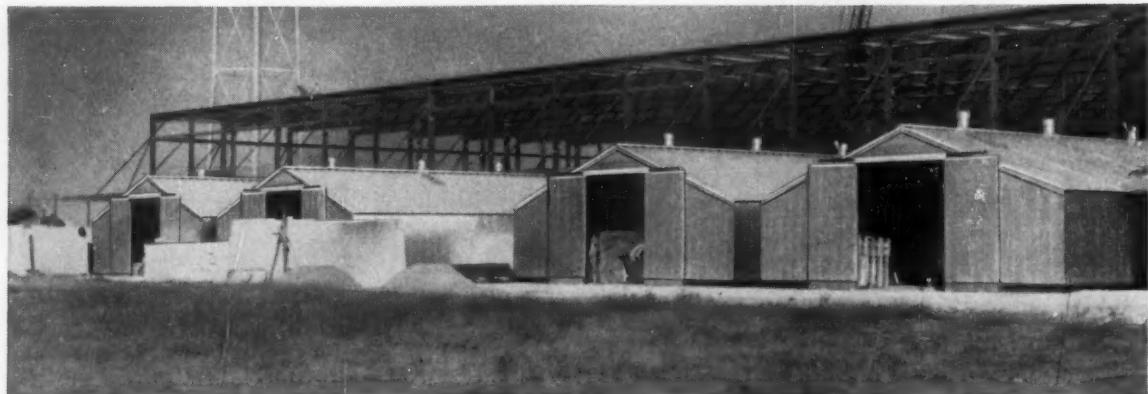
Lycoming-Design Hercules Four Cylinder Air-Cooled Industrial Gasoline Engine, Displacement 176 cu. in.



Hercules Four Cylinder Water-Cooled Diesel (or Gasoline) Engine, Displacement 173-198-226 cu. in.

*Hercules engines are also available in six cylinder 260, 298 and 339 cu. in. valve-in-head water-cooled types.*

# How a Contractor and a Manufacturer Saved Money with an Armco Steel Building



Four Armco Steel Utility Buildings, in foreground, provide shelter for textile machinery while the new Carlisle Finishing Company plant is being completed. Later, they were dismantled and moved to other cities for re-erection on permanent sites.

When Carlisle Finishing Company, Carlisle, South Carolina, drew up plans for a new plant, the company and the building contractor made a novel agreement that saved money for both of them!

The contractor, Daniel Construction Company, Inc., of Greenville, South Carolina, put up an economical 70- x 140-foot Armco Steel Building for their use during construction of the main plant. After construction work was completed, the Armco Building was turned over to Carlisle, a division of Cone Mills Corporation, textile manufacturers of Greensboro, North Carolina. Now it's a permanent warehouse.

On the same project, company officials had the problem of storing textile machinery arriving before the plant was completed. As a solution, they erected four Armco Utility Buildings, each 36 by 48 feet, adjacent to the site for this purpose. After the new plant was completed, two of the buildings were dismantled, moved about 150 miles to Greensboro, North Carolina, and re-erected at the owner's White Oak Plant. The other two buildings were also dismantled and sent to the Greenville, South Carolina, plant to be used for storage.

In each case, an Armco Building provided shelter at the construction site and was later used as a permanent structure for another purpose.

\* \* \*

Armco Buildings, with their all-bolted construction that simplifies erection or re-erection, are one of the more than 30 Armco Drainage and Construction Products for industrial, municipal, highway and railway applications. Write for data. Armco Drainage & Metal Products, Inc., 3098 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.



This Armco Steel Building was purchased by the Carlisle Finishing Company to serve as shop, office and equipment storage for the contractor. According to plan, it was later used as a warehouse by the owner.



These Armco Utility Buildings are shown here after being dismantled, moved 150 miles, and re-erected at another of the owner's plants.

## Armco Construction Products



## MINING CAVERNS ... continued



**STARTING CAVERN**—Drillers enlarge chamber at shaft bottom to begin cavern. Tight quarters restrict progress.

reach the muck at the top heading. This is done by shooting only one-third layers of the bench at a time. In fact, a layer can be lifted by a shot consisting of only three horizontal holes.

Muck is handled at the faces by the HD-6's. Equipped with 2½-yd buckets, these rugged units first build up piles of muck, then push them back through completed drifts to one of two re-handling piles on either side of the shaft. Here, Eimco 21's on tracks load buckets from each pile and push them to the shaft.

To avoid delays, three 1-ton buckets are used. Generally, one will be in the shaft or unloading on top while the other two are being filled by the Eimcos. For best efficiency, the two Eimcos alternate. When an empty bucket is lowered to the bottom of the shaft it is quickly pulled to one side, and the hook is transferred to the waiting full bucket, which is promptly hoisted above. Then the empty is transferred to the car behind the Eimco, which pulls it to the muck pile nearby. And at about the same time, the opposite Eimco pushes the next full bucket to the shaft, and the operation is repeated.



**BURN CUT**—Center of heading face is removed first by five-hole cut. Center hole is not loaded. Others converge.

Muck buckets are hoisted at the extremely fast speed of 2,200 fpm. In fact, the operation is so organized that buckets can be hoisted, dumped, and returned at the rate of two per min.

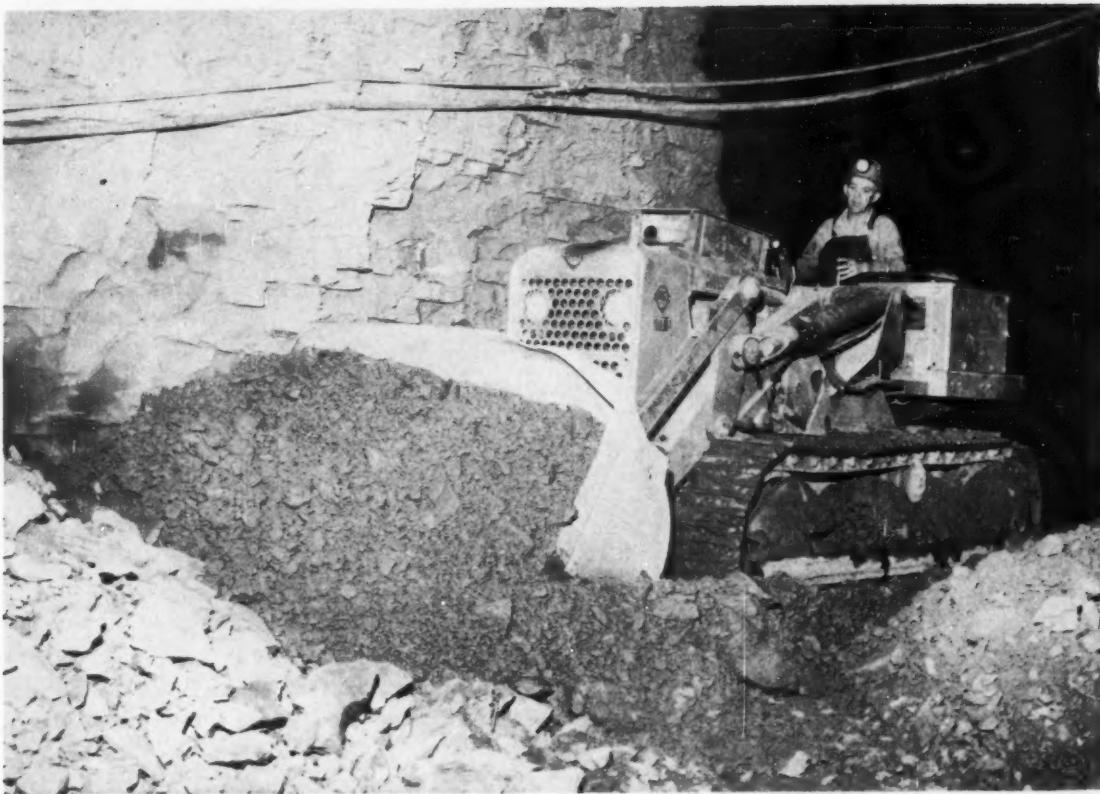
Powered by a 150-hp variable speed motor, the Red Giant hoist is housed in the headframe above the shaft. It is mounted alongside the axis of the shaft so that its operator can easily dump the buckets. It's a fast operation. When the bucket is hoisted to the top of the headframe, the operator opens a wood barrier flap which prevents muck from falling into the shaft. The flap also serves to chute muck to the ground outside. With the flap in place, the operator takes a hook connected to a fixed line and snaps it into an eye on the bottom of the bucket. Then he lowers the bucket a few feet with the hoist, causing the fixed line to upend the bucket and dump its contents into the chute. The reverse procedure then sends the bucket down the shaft for reloading. And meanwhile, the muck under the chute is loaded into trucks by tractor shovels.

Besides a main shaft for each of the five cavern compartments, there are also three drilled vent



**SWITCHING BUCKETS**—Muck is handled fast by pair of Eimcos on short track.

**MINING CAVERNS... continued**



**MUCK HANDLING**—Allis-Chalmers HD-6 tractor shovel assembled underground piles muck at heading, then pushes it to point

near shaft where Eimcos load into buckets. Equipped with exhaust scrubber, 2½-yd rig pushes piles up to 250 ft.



**TRACTOR PARTS**—HD-6 loaders are broken down into small pieces to permit travel through small shaft. Five rigs will undergo dismantling, some of them twice.

holes. An Elliot blower forces 8,000 cfm into two 12-in. holes, and exhaust moves out through one 12-in. hole. After a blast, the blowers reverse to exhaust the fumes.

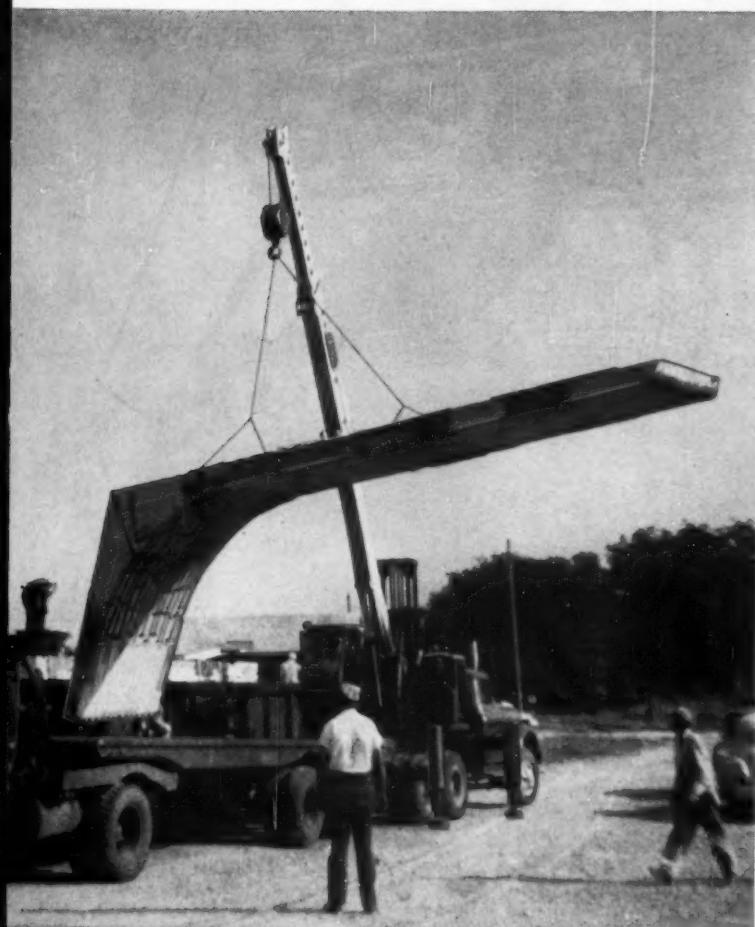
All blasting is done at the end of each shift to allow adequate time for exhausting. The two 9-hr shifts are separated by a 2½-hr gap. During a typical shift, each of the seven crews will drill and load two or three rounds, which means that 15 or 20 rounds are fired simultaneously in each compartment.

All utilities are carried into the caverns through pipes welded to the outside of the steel casings in the main shafts. There are five 2-in. and three 1-in. pipelines.

Compressed air is developed by one Fuller 1,658-cfm unit and two Ingersoll-Rand 600-cfm compressors.

G. J. Fenix is project manager for Fenix & Scisson, assisted by C. E. Stover and R. S. Mayfield. Esso Standard Oil Co. is represented by A. J. Geiger, A. P. Dennis, and F. Stober.

# Bucyrus-Erie Announces New, Improved 12-ton 1/2-yard H-5 Hydrocrane with 90 Hydraulic Horsepower to boost your profit range



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Now, the capacity of the H-5 Hydrocrane is boosted to 12 tons. And an extra complete hydraulic circuit provides faster speeds and better coordination of all crane movements.

In addition, the H-5 has many outstanding new features that put it farther ahead of ordinary truck cranes. Check these new advances and see why the new H-5 can make more money for you.

## Crane Capacity Increased to 12 Tons

One-third more useable horsepower is now provided. More powerful boom hoist, stronger outrigger boxes and high alloy steel in hoist standards help raise crane capacity, open new job opportunities.

## Three Separate Hydraulic Circuits Develop Powerful Precision Control

Three independent circuits, each supplied by a separate pump, let you coordinate crane movements faster . . . and still maintain precision control. Pump drive is now enclosed and runs in oil for longer life. No maintenance or adjustment of V-belts required.

## Selector Valves Increase and Concentrate Speed and Power

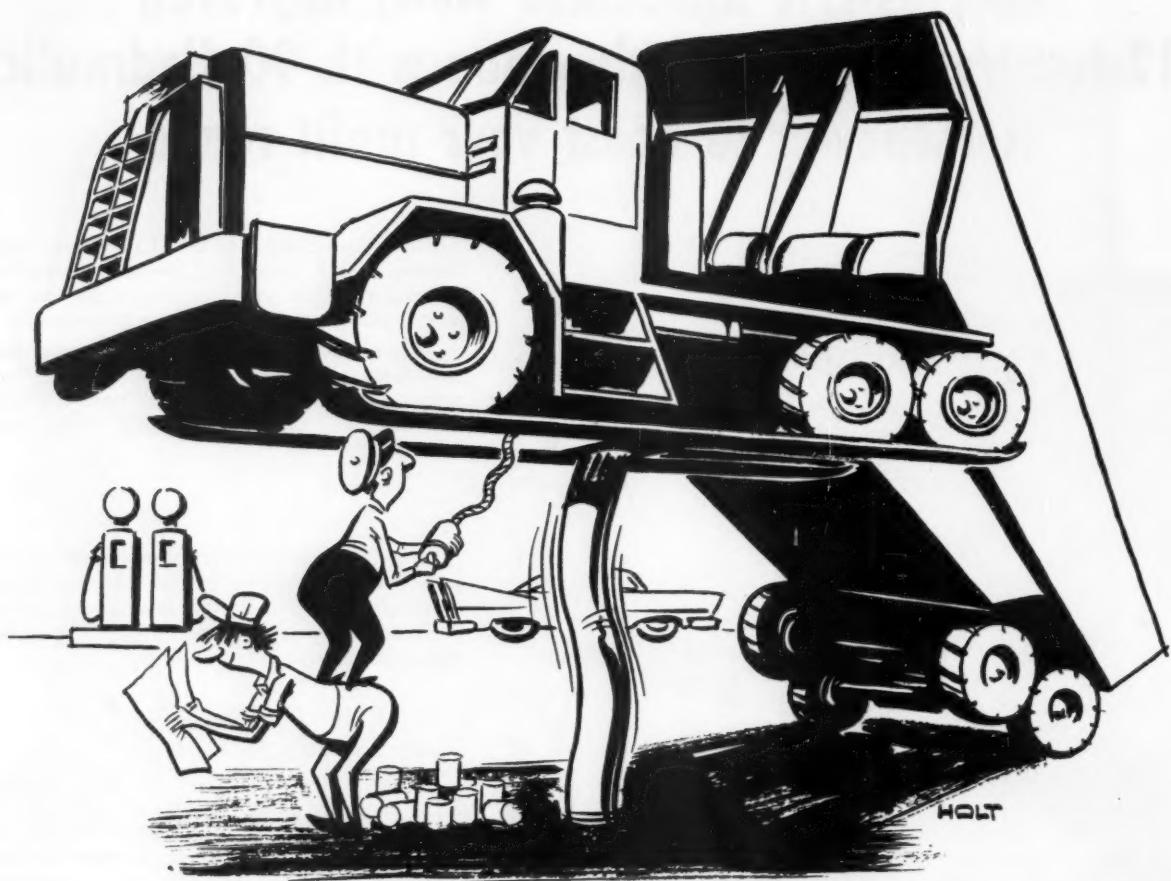
Speed of any movement can be doubled while safely controlling other motions. You can divert flow of oil to where it's needed for added speed. Each circuit contains its own improved relief valve.

## New 12-volt System Assures Starts in Severe Weather

Modern 12-volt electrical system is used to start independent power plant for quick starts in all climates.

These new, improved machines retain all the outstanding features of their popular fore-runners . . . low-cost truck mounting (new or used), hydraulic telescoping boom, short tail swing, patented outriggers, open road speeds up to 50 mph. Three-piece boom extends to 50 feet, retracts to 26 feet to provide less than 35 feet overall length of truck for travel. See your Bucyrus-Erie Hydrocrane distributor for the whole story on why the new H-5 Hydrocrane boosts your profits. Bucyrus-Erie Company, South Milwaukee, Wisconsin.

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## Why use automobile grease in heavy-duty equipment?

Let's not kid ourselves about the difference between the lubrication requirements of automobiles and heavy-duty machinery. D-A Lubricants are compounded specifically for heavy-duty equipment. There is a right one for every application.

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Let your D-A Representative give you all the facts on how D-A Lubricants can reduce parts wear and minimize downtime . . . *increase the return on your equipment investment.*

**D-A Lubricants make equipment last longer**



# Temporary Bridge Rides Over Crest of Dam

**BRIDGING THE GAP**—Downstream legs of temporary bridge found on dam crest (right) while upstream legs rest on bedrock. Bridge connects isolated midstream cofferdam (below) to shore.



**INSIDE THE COFFERDAM**—Upstream piers for bridge legs are poured on bedrock in the dry while dam is under construction. Timber mats on dam face help to cure concrete.

A TEMPORARY BRIDGE, inexpensive to build, easy to dismantle, and salvageable, is used to haul excavated material from midstream cofferdams for an \$800,000 concrete diversion dam across the Potomac River in Little Falls, Md.

Beauty of the bridge, dreamed up by the James McHugh Construction Co. of Chicago, is that it can be built within cofferdam walls in the dry and that half of it requires no foundation but simply rests on completed portions of the dam.

The dam is part of a \$4.5-million contract for a water supply station that will take water from the Potomac River for the District of Columbia. Included in the job are a water tunnel, a pumping station, a 216-ft single-span prestressed concrete bridge, and an ogee crest dam 14 ft high and 1,500 ft long.

McHugh devised the temporary structure when the state of Maryland asked the U.S. Army Corps of Engineers to include in his contract the building of a four-stage cofferdam to unwater a work area for construction of the dam.

Purpose of the four-stage restriction was to prevent the inundation of upstream river banks that might have resulted from construction of a two-stage system. But this meant that two of the four cofferdams would be isolated in midstream, leaving no access road between cofferdams

## TEMPORARY BRIDGE... continued



**LEVELING BEDROCK**—Workmen bore load holes in rock with hand-held, air-powered sinker drills. Muck is loaded into skip buckets that are lifted by crane to waiting trucks.

and shore. The bridge seemed the only answer.

Starting from the Maryland shore, the contractor built up a rock cofferdam with an earthfill core 285 ft out into the river, 40 ft wide, and with a 1 to 1 slope. Walls of the cofferdam served as the mount for a Bucyrus-Erie 38-B crane fitted with a 1½-yd dragline bucket and a Bucyrus-Erie 22-B backhoe with a ¾-yd bucket. These machines stripped overburden from inside the cofferdam areas down to bedrock. Two Euclid 10½-yd dump trucks carried muck to a fill area near the job.

Once rock was exposed, the construction crew began the removal of 5 ft of rock to reach designed dam foundation grade. McHugh mounted two Gardner-Denver Air-Trac drills on the upstream and downstream rock ledges to drill two parallel lines of 5-ft holes on 2-ft centers. Hand-held, air-powered sinker drills bored intermediate holes on staggered 2-ft centers.

Shots of five 1-sec delays pulled 5 ft of finely fractured rock. Reason for the 1-sec delays? The blast foreman felt that long delays would avoid ripping connecting wires.

One pound of DuPont 40% Special Gel powder went into each hole. DuPont electric blasting caps detonated the charges. After each shot, workmen hand-loaded rock into 2-yd skip buckets that were lifted and dumped into the Euclids by crane. Then, when a section finally had been levelled, the contractor curtain-grouted the upstream face. Holes were drilled 15 ft deep on 5 to 15-ft centers and pumped full of grout to seal voids and faults in the rock.

The dam itself was built in three 5-ft lifts. Rock bolts held steel Blaw-Knox forms for the first lift. Pencil rods protruding from previously poured concrete held forms for the later pours.

A Butler batch plant delivered 2,500-psi concrete for the work. This plant also supplied concrete

for the other phases of the water project.

Once a section of dam had been poured and cured the length of the cofferdam, the contractor built up a length of 20-ft-wide temporary bridge that founded partially on the dam crest. The bridge consisted of a series of WF steel beam bents carrying 12-in. WF stringers. These stringers supported timber planking.

The dam crest served as foundation for the bents' downstream legs. To build these, the contractor first placed 3x3-ft pieces of tar paper over the crest on 20-ft centers. A 3x3x2-ft concrete pier was poured over each sheet of paper. The paper will help break bond between piers and dam crest during bridge removal.

The bridge's upstream legs were founded on 4x4x3-ft concrete piers poured on 20-ft centers over the bed rock. Columns of 12-in. WF beams then were bolted to the concrete piers. Capping the columns with a 20-ft length of 12-in. WF beam completed the bent. Two WF steel stringers then were run over the bent. Legs were cross-braced with additional lengths of beams.

With a crane mounted on the trestle, cofferdam material from the first stage cofferdam was moved to form the walls of the second stage, breaching the first stage and permitting water to flow over the completed portions of dam. When the second cofferdam was completed, it was unwatered and excavation started. Material removed from within the second cofferdam was trucked over the bridge to shore.

As each additional cofferdam is built, additional sections of bridge will follow until the complete crossing has been made. To remove the temporary bridge, all McHugh will have to do is send a diver down into the shallow water and burn free the upstream bent legs. The bent then will be lifted clear of the dam and set on shore where it will be disassembled and its parts salvaged.

The dam will divert water into the pump station which will have a capacity for moving 600,000,000 gal daily. Project manager for McHugh is Roy Stickny. S. E. Neely is area engineer for the Corps of Engineers with Calvin R. Burke as project engineer. Col. George B. Sumner is District Engineer, Washington District.

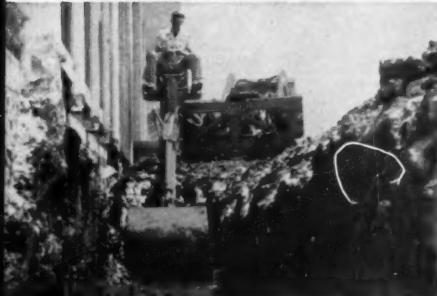
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# Rising costs . . . shrinking profits . . . can you beat the profit squeeze?

Like most everything else, equipment costs have gone up and are still rising. The U. S. Bureau of Labor Statistics price index for construction machinery rose 6.7% over a year ago—and that figure doesn't include the recent price increases averaging 7% by equipment manufacturers.

But highway bid prices have held the line in the face of these higher equipment and labor costs. According to the composite mile bid price index of the U. S. Dept. of Commerce, there's been an increase of only one-tenth of one percent in the past year. Common excavation bid prices were up only 1.5% in the same period.

## Costs Up . . . Profits Down

The obvious result of these higher costs, with bid prices remaining almost constant, is a real squeeze on the profit margin. It's probably the biggest factor in the 22% increase of business

failures among contractors over last year. Net profits shrink fast under these conditions unless men and machines produce more. How to get this increase in production is the problem facing most dirtmoving contractors.

## What's the answer?

With competition keeping bid prices almost constant, and with equipment and labor costs going up, modern earthmoving machines are the best bet to protect profits. Careful cost analysis may show that a partial replacement of your equipment—using a more efficient tractor for push loading scrapers, as an example,—would pay off in more yardage. Or your study may show that a change-over to other sizes or types of equipment would improve profits by a good margin.

*The "Twin" Scraper has unequalled workability . . . works efficiently as a one-man earthmoving spread because it self-loads and can handle a wide range of assignments.*





*On big yardage, high production jobs the "Twin" team of Euclid TS-24 Scraper and TC-12 Crawler moves dirt faster and cheaper than any other combination of equipment—under good conditions or on the toughest going you've ever seen.*

### For instance . . .

Let's assume you're using a spread of three 18 yd. scrapers push loaded by a 200 h.p. tractor . . . job management is excellent and operating conditions on all phases of the project are good . . . but you bid close and your profit margin is pretty thin. To move more yardage you consider using a bigger tractor to get better loading performance with these three scrapers. One manufacturer has pointed out that this larger crawler could boost production by 20% and effect a 12½% reduction in cost per yard. That's certainly a big improvement in your profit picture.

But suppose you want to obtain the maximum profit potential from your job . . . you consider another possibility . . . the use of Euclid "Twins" in place of your original equipment spread. Again assuming the same job conditions, here's what the production and

cost figures would show. With 2 Model TS-24 Twin-Power Scrapers and a TC-12 "Eue" Crawler, you'd get 45% more yardage than you would with the spread of 3 scrapers and 200 h.p. tractor . . . and you'd save 23% in your cost per yard. If job conditions were really tough, the return on investment would be even greater. It's earning power like this that has helped contractors with "Twins" beat the profit squeeze on all kinds of work.

### On the Highway Program

Euclid Twin Scrapers and Crawlers are moving the cheapest dirt in all parts of the country. On the Illinois Toll Road, for example, 8 contractors are using a total of 50 "Twins" and many of these 24 yd. "Eues" work under adverse conditions that stall other scrapers. More and more contractors are finding Euclid "Twins" have more earning power than any other equipment. If you haven't checked the facts and figures, have a Euclid Dealer show you why "Twins" give you a bidding advantage and are your best investment.

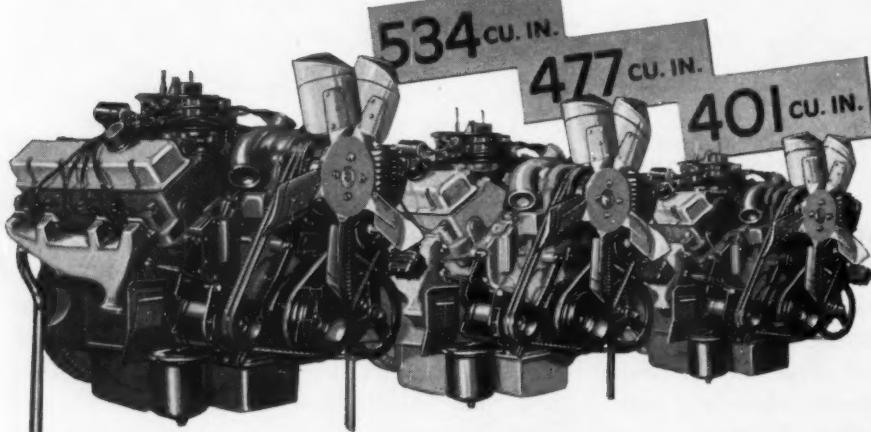
**Engineered to fit the job . . .**  
**Euclids are your best investment**



**E U C L I D D I V I S I O N**  
General Motors Corporation  
Cleveland 17, Ohio

# FORD makes the 3 all-new Super Duty V-8's

- Gross horsepower up to 277
- Gross torque up to 490 lbs-ft
- Modern Short Stroke design
- Three-stage cooling system
- Machined combustion chambers
- Sodium-cooled exhaust valves
- Stress-relieved block and heads
- Pyramid-type connecting rods
- Internally mounted oil cooler
- Two-quart oil filter
- Water-jacketed intake manifold
- Submerged-type electric fuel pump



277-hp Short Stroke V-8  
Torque: 490 lbs-ft  
@ 1800-2300 rpm

260-hp Short Stroke V-8  
Torque: 430 lbs-ft  
@ 1800-2300 rpm

226-hp Short Stroke V-8  
Torque: 350 lbs-ft  
@ 1800-2300 rpm



## 10 all-new Extra Heavy Duty Series

**GVW's up to 51,000 lb.** For '58, ten new basic series are added to Ford's already extensive Heavy and Extra Heavy Duty line. Four new Tilt Cabs, four new Conventional, and two new Tandem models offer GVW ratings up to 51,000 lb.

**GCW's up to 75,000 lb.** New T-950 Tandem is rated for 75,000-lb. GCW. Biggest single-rear-axle models are rated for 65,000-lb. GCW.

**Front axle capacities up to 15,000 lb.** Choice of three front axles in most new Ford Extra Heavies. Rated capacities of 9,000 lb., 11,000 lb. and 15,000 lb.

**Rear axle capacities up to 29,000 lb.** Wide choice of rear axles includes single-speed and two-speed, single

reduction and double reduction types. Capacities range from 18,000 lb. to 29,000 lb.

**Bogie axle capacities up to 38,000 lb.** For '58 there are two new Extra Heavy Duty Tandem Axle models. The new T-950 Series features a tandem rear axle assembly rated for 38,000 lb. New T-850 Series offers choice of 28,000- or 34,000-lb. bogies.

**New highway transmissions.** Roadranger transmission is available in all ten new Ford Heavies and Extra Heavies. Up to 33% less shifting. "Short Fourth" highway transmissions also available on "F" and "C" Series. With these new transmissions, engines operate in peak horsepower range with greater fuel economy.

# **big move for '58**

**-up to 534 cu. in.**



New Series T-950 Tandem model is biggest capacity Ford truck ever built! Rated up to 51,000-lb. GVW—7½,000-lb. GCW. New 534-cu. in. Super Duty V-8 provides exceptional horsepower and torque with rugged durability.

## **FORD TRUCKS COST LESS**

**LESS TO OWN . . . LESS TO RUN . . . LAST LONGER, TOO!**



**450 TPH**—By combining an efficient Pioneer portable rock plant and a good material flow system, Wm. J. Kennedy & Son produce

every ton possible from an especially bad pit. Production of 1-in. minus sub-base product at times reaches 450 tph.

## Good Flow Plan Milks Profits

WHEN A ROCK PLANT is asked to produce profitable quantities of 1-in. minus sub-base product from an especially bad pit, the difference between success and failure usually depends upon how smoothly the raw material flows from the pit to the laydown site.

That's been the experience of contractor Wm. J. Kennedy & Son of Footsville, Wis., whose portable crushing-screening plant is turning out up to 450 tph for the Wisconsin State Highway Dept. Seldom has production fallen below 300 tph.

Measured by any standards, Kennedy's pit at Port Washington, Wis., is a tough one. The deposit of highly abrasive glaciated gravel contains hard, rounded cobbles, large boulders in the 18-20-in. range, and even some

cemented conglomerate. In addition, the pit runs to about 15% sand.

Kennedy's rock plant is a portable Pioneer 45-VE Duplex with a 4022 twin roll crusher, 1036 jaw crusher, and a big four-deck screen that provides 96 sq ft of sizing area. A Cummins diesel-electric set supplies conveyor and screen motors, and a straight Cummins diesel engine powers the crushers. Both are truck mounted and connected to the plant by a direct jackshaft.

Kennedy's material flow system is simple but effective. The plant is charged from a trap equipped with a reciprocating plate feeder that delivers material to a 30-in. portable input conveyor. The trap is a 14-ft length of Armco culvert that is 9½ ft wide and 6½ ft high when skidded into

position—preferably at the bottom of a bank. Material is built up on the culvert section behind a timber bulkhead.

A Caterpillar D7 crawler with a U-blade keeps the trap supplied when it is located at the bottom of a bank. But at times it has been necessary to move the trap to higher elevations. When this happens two U-blade dozers load the trap, and an Allis-Chalmers HD-5G loader pushes in corner material so that the dozers do not have to push too far uphill. This bulldozer-gravity feeding system has proved to be more productive than dragline feeding, Kennedy says.

A job-built device that picks oversize rocks off the input conveyor belt before they can clog the crushers is a good example of the thought that went into Ken-



**ROCK PICKER**—Home-made device on input conveyor cuts down time. As chain drive rotates shaft set at 45 deg to belt, teeth send oversize stones down chute into truck.

## From a Tough Pit

nedy's plant layout. The stone picker, which is located about 5 ft from the top of the belt, has cut downtime considerably, according to president Robert Kennedy.

The stone picker is a hub fitted with teeth and welded to a shaft that is rotated by a 1½-hp motor with a gear reducer. The shaft is held in a frame at a 45-deg angle to the belt. The teeth, which are made from drill steel and welded to the hub, stick down to within 8 in. of the belt. Teeth are longer at the center than at the ends of the belt to compensate for troughing.

The shaft is rotated by a chain drive from the electric motor, but Kennedy contends this is a mistake that he will correct on future jobs. The drive should be V-belt rather than chain, he says,

because a V-belt drive cushions shock much better.

After oversize stones are rejected by the picker, they are dropped down a steel chute into the bed of an old truck. Since they must be hauled away sometime, this saves secondary handling and keeps the plant area clean. The truck is dumped during the lunch period or at other times when the plant is shut down.

Kennedy plans to equip the input conveyor with still another home-made stone picker as added insurance. This will be a frame at the very top of the conveyor that will be fitted with teeth extending down to within 8 in. of the belt. These teeth will not rotate.

The flow of material through the high-capacity rock plant is highly efficient. The input conveyor feeds into the plant's third deck, which passes acceptable fines down through the two bottom decks and out to storage. Oversize rock goes to the 1036 jaw crusher, and throughs return to the top deck on a conveyor belt and bucket wheel elevator.

Like the 48-sq-ft bottom deck, the top deck is also available for screening to specification size. Oversize rock from this deck passes through the 4022 roll crusher and returns on a inter-plant conveyor and bucket wheel elevator to the top deck for further sizing.

*continued on page 100*



**DEPENDABLE POWER**—Off-plant power is supplied by truck-mounted Cummins diesel engine and diesel-electric set connected to plant by well-protected direct-jackshaft.



*This job called for speed!*

## **GYRO-FLO 85 saves time as contractor changes underground tanks at 40 gas stations**

Sunoco's new variable octane gasoline required new underground storage tanks at the forty service stations in the vicinity of Newburgh, N.Y. Contractor Ira D. Conklin and Sons was told that each installation had to be *fast*. None of the stations could be shut down during the work... gasoline trucks were actually standing by to fill the new tanks as they were lowered into their excavations.

Since it was necessary to make fast moves with men and equipment from station to station on heavily-traveled streets, the contractor used the highly-portable Gyro-Flo 85 as his primary source of air power. This portable—the only rotary built in the 85-cfm size—provided air for diggers and

paving breakers during excavation.

At one station heavy rainstorms caused flooding of an excavation that had already been prepared. A hurry-up call was put through for the Gyro-Flo 85 working at a station some distance away. The compressor was rushed to the scene, hooked up to an I-R sump pump, and dewatering was accomplished while the tank was being lowered into its excavation.

Meeting tight deadlines is a Gyro-Flo habit: the lightweight model 85 matches the larger Gyro-Flo models (up to 900-cfm) in the essential element of dependability under the most demanding job conditions. Ask your I-R distributor for details or write for form 2307.

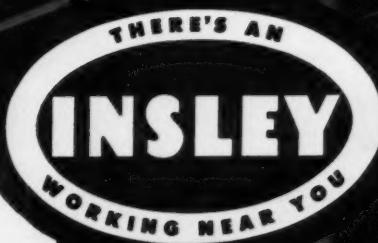
# Ingersoll-Rand

11 Broadway, New York 4, N.Y.

CONTRACTORS'  
COMBINATION



**AN UNBEATABLE COMBINATION... GYRO-FLO COMPRESSORS AND I-R ROCK DRILLS**



## INSLEY type WB

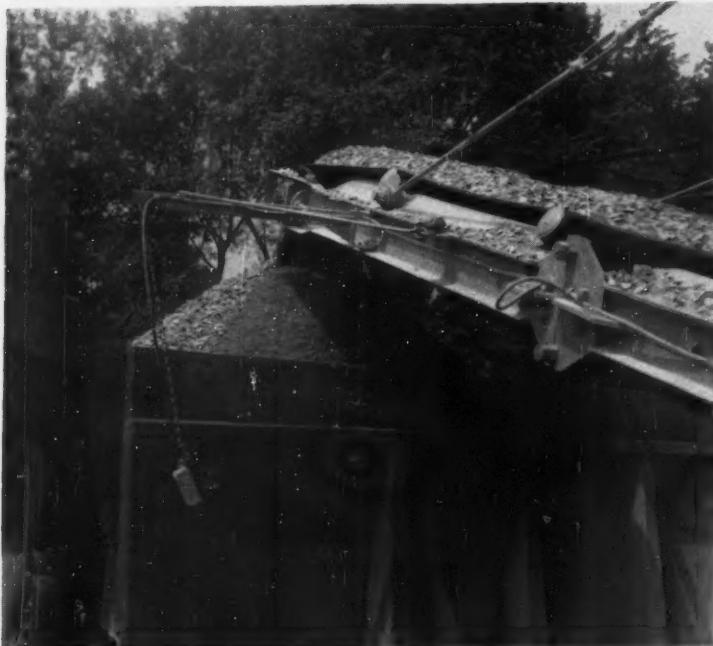
*versatility...mobility...dependability!*

The Insley Type WB is proving its dependability every day with contractors from coast to coast. Insley's proven design characteristics make the Type WB a dependable machine—simple to service, easy to maintain. The WB is convertible to all front end attachments and available with crawler, Maxi self-propelled carrier and lorry mountings. Gasoline, diesel or electric power.

*Let your Insley distributor show you an Insley at work.*

**INSLEY MANUFACTURING CORPORATION**  
GENERAL OFFICES—INDIANAPOLIS 6, IND.  
WEST COAST DIVISION—LOS ANGELES 54, CALIF.  
**THE MAXI CORPORATION** (Subsidiary) LOS ANGELES 54, CALIF.





**CONTROLLED FROM CAB**—Discharge belt from surge bin is controlled from truck cab. Because of the extra bin, plant conveyors keep working while trucks get in position.

While Kennedy is making only one product at high speed with this screen arrangement, the 45-VE can produce four products simultaneously. It can also make chips and sub-base rock at the same time. In addition to the flexibility provided by the large screening area, jaw and roll crushers have a variety of settings that can be adjusted to fit different pit conditions. The portable plant can be set up or taken down in two days.

Another addition to the flow system that increases production is a surge bin that Kennedy places at the end of the 45-VE's discharge conveyor. The surge bin is mounted on a rubber-tired trailer and holds about 15 yd—just enough so that the plant conveyors keep running while trucks maneuver in and out from under the bin's discharge conveyor.

The conveyor from the surge bin, which is gravity fed, is controlled by a push-button switch that the driver can reach from his truck cab.

Kennedy recently bought five new 6-yd Chevrolet 5400 dump trucks to haul away the finished material to the job site. This fleet is augmented with five older trucks, all in good condition. (Kennedy keeps a well-equipped

parts and tool trailer at the job to handle repairs and maintenance of the rock plant and trucks.)

To make the haul from the plant to the highway site as easy as possible, the haul road is dressed at least twice daily with a Caterpillar No. 12 motor grader. Dust is kept to a minimum by two 1,000-gal water trucks that

sprinkle the haul road at frequent intervals.

Because of the high plant output, laydown of the material at the highway site is something more than routine. Wisconsin State Highway Dept. inspectors are on hand to measure exactly how far each load should be spread. This distance is based on a scaled weight ticket each driver receives as he leaves the crushing plant.

Sections at least 1,000 ft long are worked at a time. After loads are dumped, material is mixed and spread with a motor grader and water trucks bring the moisture content of the sub-base product up to its compaction optimum. A self-propelled 13-wheel Tampo pneumatic roller handles compaction.

Kennedy's foreman is Jerry Cook, who is responsible for both plant and laydown production. The size of his labor force at the crushing site is another money saver for Kennedy. It consists of two catskinners to supply the feed trap, a plant operator, and Foreman Cook.

Because he's paid an incentive bonus over and above his weekly salary when things are going well, the high rate of production from the tough Port Washington pit makes Jerry Cook almost as happy as his boss—and his boss is plenty happy. His success enabled Kennedy to take on a 1,000,000-yd job for the North Illinois Tollway.



**AT THE SITE**—After a load is dumped, it is mixed and spread by a motor grader and sprinkled by a tank truck. A 13-wheel Tampo pneumatic roller handles compaction.

## ENGINEER'S FIELD REPORT

PRODUCT RPM DELO OIL

FIRM C. H. LAWSON, INC.

### Using RPM DELO Oil heavy-duty engines outlast equipment



**C. H. Lawson, Inc.** operates 78 pieces of road building equipment ranging from new to 15 years old, all using RPM DELO Oil. Only one engine has ever required major overhaul and that was not due to lubrication. Firm's chief mechanic, E. C. Miller, says,

"RPM DELO Oil has been used exclusively in all our heavy duty engines since 1944. In many cases, it has enabled engines to outlast the equipment." Euclid Earth Mover (above) gets a push from a bulldozer to provide extra traction in wet earth.



**TD 24 International** (left), one of firm's 12 bulldozers, helps clear the way for a Route 50 by-pass at Riverdale, Maryland. This two year old tractor has operated more than 4,000 hours without engine repairs. Company owner, C. H. Lawson (right), reports that RPM DELO Oil keeps the engines in his equipment in such good shape that—regardless of operating conditions—they average approximately 4 years or 10,000 hours service before even minor repairs are required.



TRADEMARK "RPM DELO" AND DESIGN  
REG. U.S. PAT. OFF.

**STANDARD OIL COMPANY OF CALIFORNIA**, San Francisco 20  
**THE CALIFORNIA OIL COMPANY**, Perth Amboy, New Jersey

#### Why RPM DELO Oils reduce wear—prolong engine life

- Oil stays on engine parts—hot or cold, running or idle
- Anti-oxidant resists lacquer formation
- Detergent keeps parts clean
- Special compounds prevent corrosion of bearing metals
- Inhibitor resists crankcase foaming



For More Information or the name of your nearest distributor, write or call any of the companies listed below.

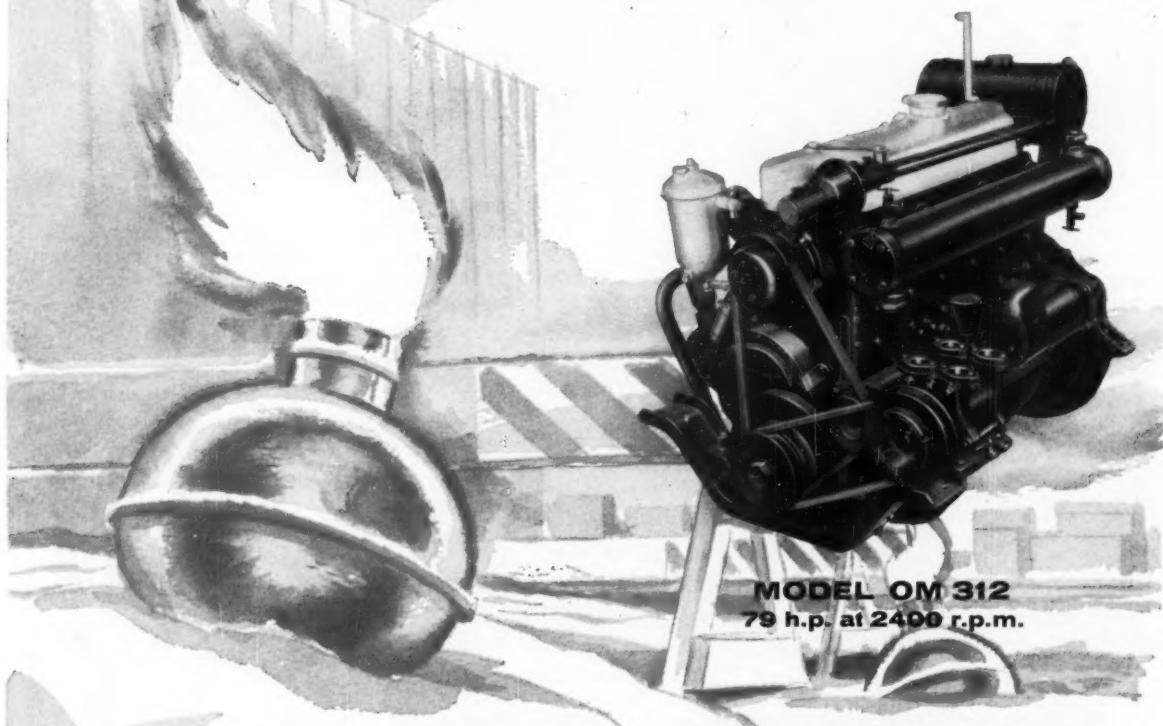
**STANDARD OIL COMPANY OF TEXAS**, El Paso  
**THE CALIFORNIA COMPANY**, Denver 1, Colorado

**Dependable Power  
For Every  
Construction Application!**



## **MERCEDES-BENZ DIESEL ENGINES**

The effortless performance and ultra-dependability of Mercedes-Benz diesels are the two most important qualities affecting the construction industry . . . Nothing is more important than keeping equipment on the job, working at a profit . . . The time-proven Mercedes-Benz diesel engine works on the 4-stroke principle with a pre-chamber combustion process assuring greatest possible quietness and smokeless combustion even under changing loads . . . Maintenance is simple, fuel consumption low and minimum space is required for installation . . . Engines are now available in ratings from 36 to 1385 h.p. to power practically every machine.



**MODEL OM 312  
79 h.p. at 2400 r.p.m.**

Other Mercedes-Benz diesels available in 12 and 20 cylinders, Turbo and Supercharged, up to 3000 h.p.

UTICA-BEND DIVISION

**CURTISS-WRIGHT**   
CORPORATION • UTICA, MICHIGAN



**With a truck pushing from one end...**



**...and the other end riding a dolly...**

## Girders Go in Twice as Fast

WHEN RESTRICTIONS hampered normal methods of erecting 14 girders on a 127-ft highway bridge, a New York contractor came up with an idea that cut erection time in half. He put two girders across with cranes, and rolled the others over them on a dolly.

The bridge was the new Bruckner Boulevard Bridge in New York City, replacing an overcrowded existing structure over the New Haven Railroad. Prospect Iron Works of Brooklyn had the \$250,000 contract for steel fabrication and erection.

One big restriction was traffic, both road and rail. Vehicular traffic on Bruckner Boulevard is very heavy and so is the train movement on this line of the railroad.

Erection work had to stop while trains were passing, and, because of the limited working space, auto traffic had to stop during most of the erection. This meant that speed of handling was of prime importance.

Prospect put the two center girders across with two cranes, a 40-ton P&H truck crane on one bank and a 50-ton Lima crawler

crane on the other side. The cranes did the job, but they took 16 hr and caused a lot of traffic jams.

Also it was awkward to operate the cranes amid the overhead electric wires and tricky to handle the 30-ton, 127-ft girders with one crane on each side of the gap. So Prospect looked for an easier way.

They decided to use the two girders already in place as tracks, build a dolly to run on them, and roll the remaining girders across. With a girder across the gap it would be no trouble for the cranes



**FINAL PLACING**—Workman directs cranes on each bank that pick the big girder off the dolly and truck and ease it into final position on the bridge abutments.

### GIRDERS GO IN TWICE AS FAST...continued

to handle its final positioning.

The chief engineer of the company, Theodore Van Wyngarden, designed a simple dolly made up of three H-beams and eight castors to ride between the rivets on the two center girders. The dol-

ly's capacity of 40 tons was adequate to carry half the weight of two girders.

To get the girders into place, the truck-trailer that hauled them, two at a time, from the fabricating yard moved into a

position where the girders pointed straight along the centerline of the bridge.

The crane picked the ends of the two girders off the trailer and, as the truck slowly backed up, placed them on the dolly. The crane then released its hold, and the truck did the rest of the moving.

As the truck backed toward the bridge, it pushed the girders across the gap. It had to stay almost exactly on the centerline of the bridge so it would not push the dolly off the rails. If it did start going crooked, the truck pulled forward and started the push again. This actually happened only once.

When the truck had pushed the girders as far across as it could they were within easy handling range of the two cranes. The near side crane picked one end of a girder off the truck and the far side crane picked the other end off the dolly. Together they swung it into place on the abutments.

The dolly method was a big improvement over the cranes alone, and it cut the erecting time for two girders from 16 to 8 hr.

To carry the girders, Prospect hired a truck with two 16-wheel trailers, all hooked up in tandem. Trucking took place at night or over a weekend to keep the cumbersome rig out of the heavy daytime New York traffic.



### Dolly Details

The dolly is an H-shaped rig consisting of three main beams. The two side beams, which mount the castors and run along the girders, are 12H65. A 10WF55 cross beam joins them in the middle.

Bolted connections provide flexibility. Bracing is by turnbuckle for the same reason. This flexibility helped take up the strain when the dolly and girder get slightly off line.

A plate on top of the cross beam brings its height up to the 12-in. of the side beams. The girders ride on this plate.

The plate is fastened to the cross beam by a pin in the center rather than a rigid connection, and it is 1/16 in. short of the side beams on each side. This allows the plate to swing a little with the girder and provides an additional compensation when the truck is not in line.

The capacity of the castors governs the load that the dolly can carry. Van Wyngarden used eight 5-ton castors to give a total capacity of 40 tons. This was ample to carry half the weight of two 30-ton girders.

He mounted the castors in pairs on rockers so that they could climb the cover plates of the girders as they came to them.

The castors run between the rivets of the in-place girders. This track is only 1/64 in. wider than the castors, allowing little clearance. But guides on each side of the dolly extend down over the outside edges of the top girder flanges and keep the dolly on the track.

Van Wyngarden wasn't sure at first whether the truck could handle the push alone. So he added a shackle to the dolly so that a winch could pull it. But the truck was able to do the whole job, and the shackle was not needed.

Richard "Blackie" McDowell, president of the firm, was in charge of the operation. John Lowman was field superintendent.



## "Our new TILT-CROWN DOZER does a day's work in 2 hours!"

**Joseph Artino**, Shaker Heights, Ohio, excavating and grading contractor, is really sold on the performance of his 80 HP Case® TerraTrac® Tilt-Crown dozer. The day these pictures were taken, he finished leveling and backfilling around three large homes in just *two hours*. "That same job," according to Artino, "would have taken us *all day*, and we'd have worked a lot harder, with the competitive-make dozer we previously owned."

### No clutching . . . No shifting!

"We find the TerraTrac '800' much faster and easier to operate than other crawlers," Artino reports. "There are no steering clutches to fight, and you don't waste time shifting gears. With the counter-rotating Terramatic transmission I can *shift on-the-go . . . turn on a dime . . .* merely by flipping a couple of hydraulic levers. Back-up time is cut in half because reverse speeds are twice as fast as other crawlers."

### Likes power-tilting blade

Artino says the power-tilting blade feature is a big time-saver for ditching, root-cutting and terracing work. "By tilting blade from seat, I can start cutting on the first pass, instead of making 3 or 4 dry runs to get started," he comments. "I can also make a counter-rotating turn at end of each pass . . . tilt the blade to the other side while I'm turning around . . . and thus *keep moving dirt in both directions*, instead of backing up with an empty blade. Result — I can do twice as much work."

You, too, can increase your production with a Case TerraTrac "800" Tilt-Crown dozer. See it today at your Case Industrial Dealer's, or mail coupon for details on other bulldozer sizes suited to your needs.

Up to 20,000 lbs. push enables the rugged 80 HP Case TerraTrac Tilt-Crown dozer to root-out big rocks, stumps, etc., in a hurry. Power is delivered smoothly and evenly by the torque-converter drive, which also cushions the power-train against jolting shock loads.



— Clip . . . mail for free catalog —

**J.I. CASE CO., Dept. A1498, Racine, Wis., U.S.A.**

Send full details on Case TerraTrac Bulldozer sizes checked.

100 HP    80 HP    62 HP    50 HP    42 HP

Name . . . . . Title . . . . .

Company . . . . .

Address . . . . .

City . . . . . State . . . . .

CT-D-94



1<sup>st</sup> in quality  
for over 100 years

Fast flow for low slump concrete —  
as many "chutes" as need demands —

# SMITH sets the pace for new roadbuilding



## Smith "concrete factories on wheels" help push a turnpike across Nebraska

Here is tomorrow's business today . . . as the network of America's super highways spreads across the nation under the spur of the federal roadbuilding program.

Smith "concrete factories on wheels" put speed into this gargantuan paving job . . . provide as many fast discharging "chutes" along the line as work schedules and available finishing crews demand . . . end the need for depending on the yard by yard output of a paver.

Smith's multi-speed transmission and patented T-shaped blades give absolute control over the mix . . . double mix all materials in true flow action to pro-

duce high quality "inspection type" concrete needed on tomorrow's jobs.

To put (paving) speed into turnpikes . . . profit-wise contractors look to the Smith equipped ready-mix operator . . . the man equipped to handle tomorrow's roadbuilding business today!

### LOW MAINTENANCE COST

Maintain steel drums and blades

### BIGGER PAYLOADS

Better weight distribution puts more weight forward

### CHOICE OF SIZES

4 yd thru 9 yd

(12½ yd agitator)

PTO or separate engine drive



Since 1900, the pioneer designer and foremost manufacturer of the world's finest mixers.

**THE T. L. SMITH COMPANY • Milwaukee 1, Wisconsin • Lufkin, Texas**  
affiliated with Essick Manufacturing Company, Los Angeles, California.





**PROBES AWAY**—U.S. Army Corps of Engineers' six-jet probing barge surveys Delaware River bottom as work gets underway to deepen channel between Philadelphia and Trenton.



**TAKING SOUNDINGS**—Two-man crew operates probe from 37-ft-high tower.

## Jet Probes Read River Bottom

CONTRACTORS doing a \$90-million dredging of the Delaware River between Philadelphia, Pa. and Trenton, N. J., have become accustomed to seeing a strange-looking rig floating ahead of their dredges.

The rig is a converted steel barge fitted with six jet probing devices. Its owner, the Philadelphia District, U. S. Army Corps of Engineers, calls it Jet Probing Barge No. 1. Built at a cost of \$165,000, the barge rapidly surveys a section of the river bottom, making six simultaneous probes.

The barge helps fix quantities of overburden and rock to be removed. In addition, it checks actual progress of the dredging contractors.

Normal method for making river-bottom probes is with several small scows. A hand winch in each scow controls an anchor that positions the craft, and each scow has one jet probe up to 50 ft long that is raised and lowered by hand. A portable water pump supplies water for the jetting. Nine men are needed to operate each probing scow. When a large vessel passes in the vicinity of the scow, the crew often has to slacken and then retighten the positioning cables.

Jet Probing Barge No. 1 makes the small scow with a single, hand-operated probe obsolete. On the barge, all operations are mechanized; it can do more work, much faster, at less cost.

RTC Shipbuilding Corp. of Camden, N. J., under contract to the Corps of Engineers, converted a 30x100-ft steel deck barge into the probing rig. The barge draws 6 ft of water. Heart of the barge —its cluster of winches, pumps, and engines—is housed in a 12x 45½-ft Armco prefabricated deck house. Machinery there operates anchor cables, spuds, and probes.

### Operational Parts

Five anchors secure the barge in position. Anchors are stock 750-pounders that are raised and lowered by steel cable run off four-drum Philip Dye winches powered by GM diesels. Each end of the barge is rigged with three anchor chocks. These permit positioning the barge from anchorages upstream, downstream, or to each of the craft's four quarters. Buoys chained to the anchors indicate their positions. A tug lifts and places each anchor. Winches then pull up on the cable to reposition the barge.

Passing ships mean that anchor



**TOWER MOVES**—Towers ride over tracks to permit probings on exact 30-ft centers.

## JET PROBES RIVER ...

continued

cables have to be slackened. Two steel spuds located at forward and stern quarter points on the barge's center line are lowered to hold the barge temporarily while anchor cables are slack.

Each spud weighs 17,000 lb, measures 70 ft long, and is 18 in. square. It is raised and lowered by steel cable run off a four-drum hoist in the deck house.

Real beauty of the rig is the mass probing arrangement. Three steel probing towers ride rails on each side of the barge. Each tower stands 37 ft high and is equipped for mechanical handling of a jet probe. A sprocket drive actuated by an air motor moves each tower along its tracks.

The probe itself is a 2½-in. steel pipe 58 ft long that is marked off every 1½ ft. The cable supporting the probe runs up through a sheave and down to a single-drum, Ingersoll-Rand air winch mounted on the tower's operating platform. A water hose ties into the probe and connects to a GM-driven Aurora pump on the cabin that delivers jetting water at 600 gpm. Two Ingersoll-Rand 60-cfm compressors driven off a GM diesel supply air for the operation.

Each probe is operated from its control tower. Anchors and spud cables are operated from a control deck on the roof of the steel cabin.

The barge is located by sextant readings taken on the barge from ranges on shore. The barge is moved shore to shore in 30-ft shifts. When a cross channel survey has been made, the barge is moved upstream far enough to permit the taking of probes on 30-ft centers.

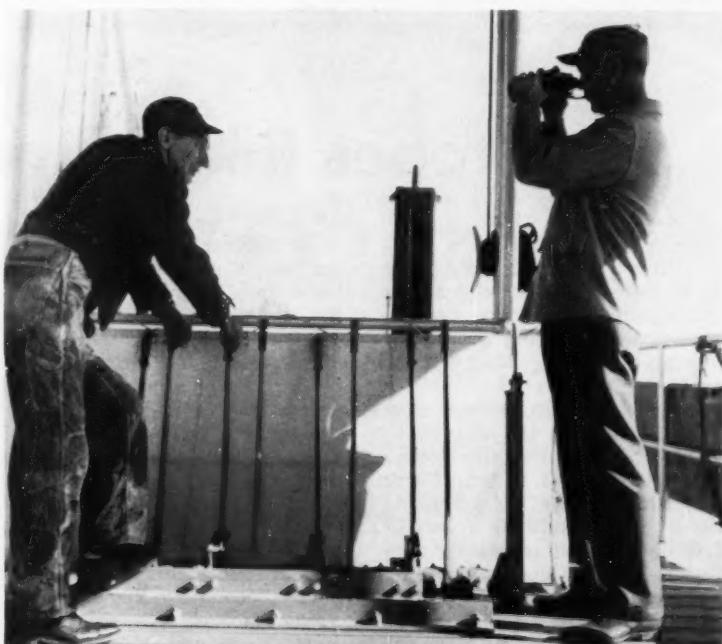
To compensate for tide differences, one man on shore takes tide readings every two minutes and makes probe reading adjustments accordingly.

The probe barge operates with a crew of 20 men, 34 men less than are needed to handle six single-probe scows. The crew consists of a captain, five operators, five deck hands, two bridge captains, an engineer, an oiler, a survey party chief, two recorders, a tide reader, and a lead-sounding man. A single tug services the barge.

Present channel between the two cities is 25 ft deep at mean low water and 300 ft wide. The



**POSITIONING BARGE**—Sextant readings taken on barge from ranges on shore record the barge's position during probings and help reposition craft for a new series of probes.



**WORKING THE PROBES**—As skipper checks a passing vessel, machinery operator drops spuds that hold barge positioned while its anchor cables are slackened, as ship passes.

dredging job, which will require six years of work, will open the channel to 40 ft in depth and 400 ft in width. Involved in the work will be the removal of some 8,000,000 yd of overburden and 2,000,000 yd of rock.

American Dredging Co. of Philadelphia is one of the contractors, but it has little rock removal. Its work involves primarily the removal of overburden. Removal of material is by hydraulic dredge with sludge piped on nearby

banks. Contractors on the job who have rock removal are Atlantic, Gulf, and Pacific Co. of New York City, and Western Contracting Corp. of Sioux City, Iowa. These contractors dredge up overburden to within 2 ft of bedrock. Then they remove rock to prescribed depth.

Herbert Trudeau is area engineer for the Corps of Engineers; Nicholas J. Barbieri is resident engineer; Col. William F. Powers is district engineer.

# NEW!

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WALK-OR-RIDE  
POWER BUGGY®



ALSO FLAT-BED MODEL

Compact, lightweight, extremely maneuverable, the new Whiteman "Walk-or-Ride" Power Buggy® is the perfect answer to placing concrete under many conditions. Travels over lighter, narrow runways, onto elevators, through 31" doors. Turns on a dime, has forward and reverse drive. Pours easily, neatly, accurately with perfected positive-control dumping mechanism.

Operator can either walk behind or ride on fold-down platform. Regulations do not require skilled labor to operate. All the time-tested stamina and rugged performance of the famous Whiteman DB-60 Power Buggy® have been built into this sturdy new Walk-or-Ride model. Ask your Whiteman dealer for full details or write for catalog today.

- Compact, lightweight
- Extremely maneuverable
- Rides on elevators
- Passes through 31" doors (With single wheels)
- Positive-control dumping mechanism
- Operator walks or rides
- 10 cu. ft. capacity
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- Low center of gravity
- Reliable Wisconsin engine (Parts available everywhere)
- Load-wheel chain drive
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- Forward and reverse drive
- Precision built, rugged.

Does the work of FOUR hand buggies.

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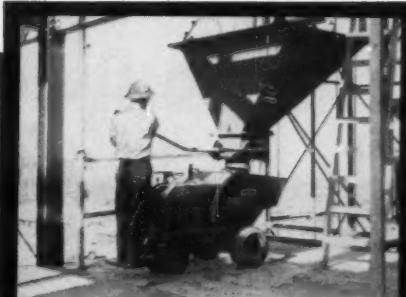
Walk-or-Ride Power Buggy       DB-60 Power Buggy  
 Screening Machines       Vibrators  
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"Walk-or-Ride" Power Buggy loads from hopper on upper floor.



Pouring is neat and accurate with positive-control dumping mechanism.

With push-tractor help both for loading and unloading, these rugged machines are moving more than 4,000,000 yd of clay embankment fill—and on schedule.

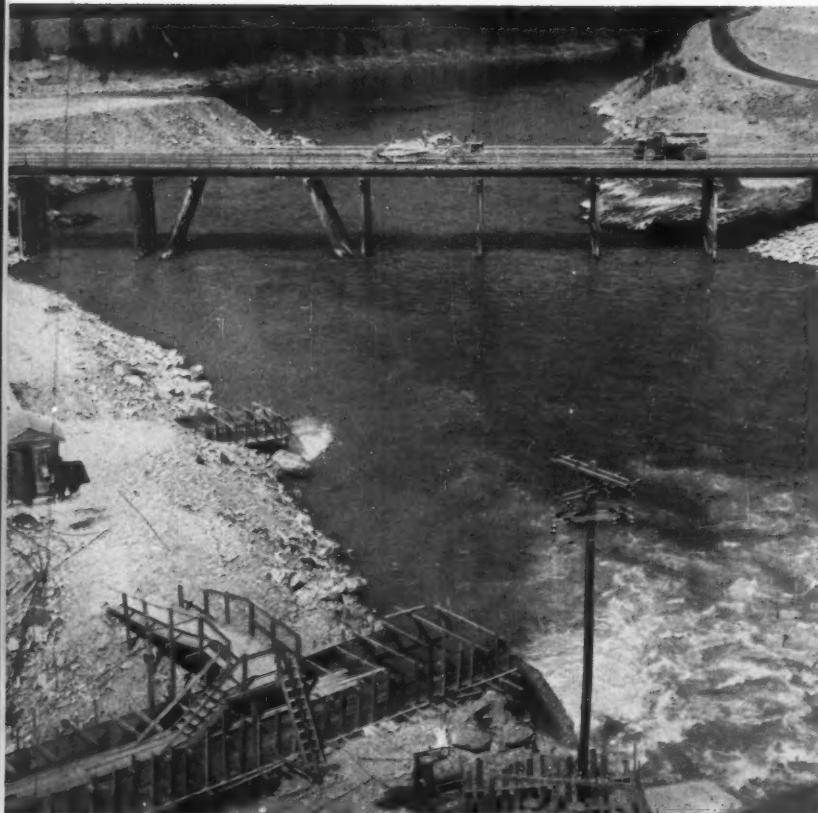


**AT THE BORROW PIT**—Huge Euclid TS-24 waits for a push while a Caterpillar D9 gives a second twin-engined giant a shove to help load a full 24 yd of heavy clay.

**ON THE FILL**—Scrapers deposit clay in 6-in. lifts while tractor-pulled sheepfoot rollers thoroughly compact clay fill in the core of the embankment.



## Scraper Fleet Digs Heavy Clay To Build Wing Embankments



**ACROSS THE RIVER**—Fill for one of the dam's two embankments speeds over temporary bridge built across Clarke Fork River as an access road between borrow pit and fill area.

MOVING CLAY CORE material for wing embankments that form part of the \$87-million Noxon Rapids Dam in western Montana is rugged work—but scrapers are meeting the test.

Fleets of single and twin-engine scrapers need push-tractor help both to load and to unload the hard-to-handle material. But, by early next year, they will have moved more than 4,000,000 yd of clay fill. And the job is on schedule.

The dam, being built by Morrison-Knudsen Co. of Boise, Idaho, is going up on the Clarke Fork River some 55 mi southeast of Sandpoint, Idaho. Besides earthfill wing sections, the job includes a powerhouse and a concrete spillway dam 470 ft long and 190 ft high. Wing sections include a north embankment 1,800 ft long and a south embankment 3,000 ft long.

The dam area is the site of a prehistoric lake that left the valley partly covered with a clay deposit. Occasional rocky ridges penetrate up through the clay and gravel layers and serve as foundation for the concrete structures and most of the north embankment.

The two embankments are substantially different in design. The



north embankment curves to follow the rocky ridge. The south embankment is relatively straight. Most of the north embankment sits on rock except for a grout curtain and sheet-pile cutoff wall set in a deep channel that cuts through the rock. The south embankment is founded on a thick layer of clay deposited by the prehistoric lake.

Scrapers handle most of the earthmoving. M-K's fleet consists mostly of Euclid and Caterpillar scrapers. Push-loaded by Cat D9 tractors, the scrapers pull clay core material for both embankments from a borrow pit on the north side of the river. The contractor built a temporary bridge across the river to haul south embankment material.

The 45-acre borrow pit contains more than twice as much fill as the contractor will need on the job. Because clay is heavy and, when wet, difficult to handle, the contractor left the large area open so that surface clay would be dry enough for scraper moving. Even so, core placing is restricted to the warm weather.

The scrapers spread the clay in 6-in. lifts to build a core 16 ft wide at the crest with 1 on 4 side slopes. Compaction is

*continued on page 115*



**LIFTING POWER**—Steel trestle that spans spillway sections of dam mounts two rotary cranes with 135-ft booms that handle concrete and other lifting chores.

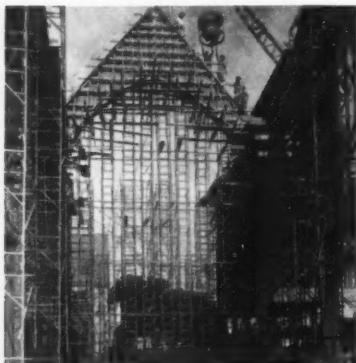
# Shoring Methods . . . by Patent Scaffolding Co.

## SAME COMPONENTS PROVIDE SHORING AND PLATFORMS; SPEED HUGE PARABOLIC ARCH

FOR BUILDING this huge, spine-like, 240'-long parabolic arch for the new, modern-design Yale University Hockey Rink, contractor, George B.H. Macomber Co., makes effective use of "Trouble Saver"® Scaffolding components for shoring and for working platforms.

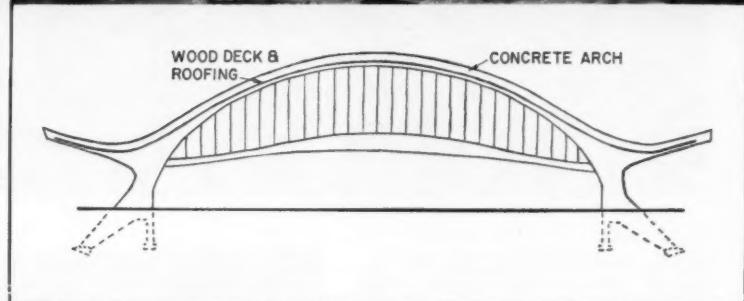
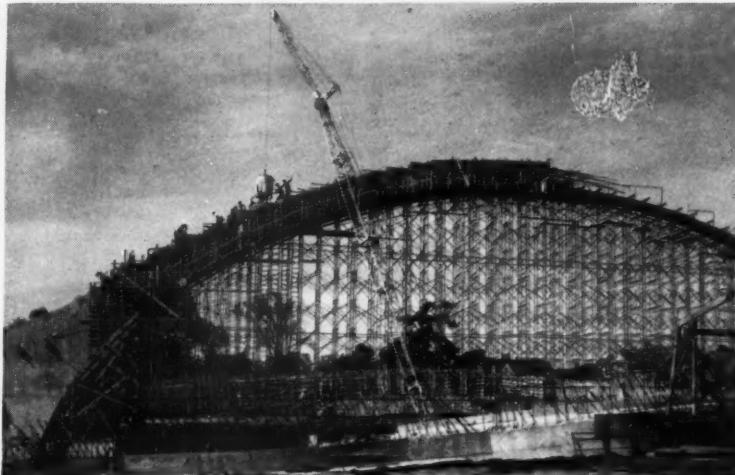
2'-wide "Trouble Saver" Shoring units with built-in ladders support the area starting 21' from each end of the arch. For a distance of 32' these units are placed 5' apart, perpendicular to the arch length, with 6" spacing between towers. The next 59' is shored with 5'-wide "Trouble Saver" frames, spaced 37" apart, parallel with the arch length, with 8" spacing between towers. 475 5'-wide frames and 410 2'-wide frames are in use. Horizontal bracing is achieved by "TubeLox"® Scaffolding members and 56 steel cable guys.

A separate working platform, made of 285 5'-wide "Trouble Saver" frames, is used on one side of the arch only for easy placing and removal of forms. "TubeLox" Scaffolding members tie this working platform to the shoring for extra safety.



**HIGH, HEAVY BEAM SUPPORT—** Southern Bldrs., Inc., needs only 228 "Trouble Saver" Shoring ladder frames, braced with "TubeLox" Scaffolding members, to support this 50'-high, 8"-thick arched concrete beam for St. Marks Church, Shreveport, La. Built-in ladders provide quick access for workers.

To help you with your scaffolding and concrete shoring methods, PS offers a complete nation-wide engineering service available to you locally. See the Yellow Pages in your 'phone directory for the nearest Patent Scaffolding office or representative that sells and rents "Gold Medal" Scaffolds.



**QUICK, STRONG BRIDGE SHORING—** Due to its high load-bearing capacity, "Trouble Saver" Steel Shoring permits Snitily Brothers, contractor, to get an entirely accurate camber section for this 2-arch (each 52' long) underpass bridge on the new Peninsula Drive near Moses Lake, Wash. 396 shoring frames of various heights are erected quickly to support the slab thickness of 2 1/4" at pier edges and 1 1/2" at the 18'-high midspan points. By using versatile, prefabricated steel shoring, instead of wood, forming costs for highway bridges, overpasses and piers can be cut at least 25%. Highway Bulletin G208 gives complete facts, ask for it.

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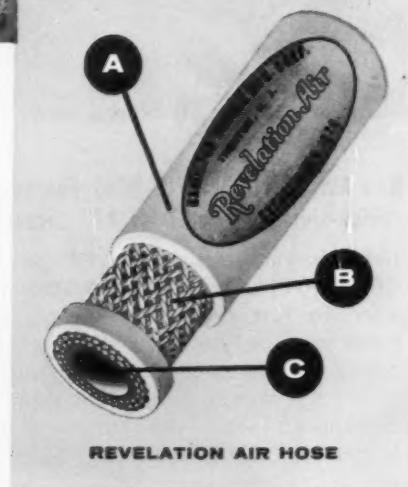
## Hamilton Revelation...air hose with built-in profit protector

Hose failures can spell the difference between profit or loss, with today's mounting costs. Revelation Air Hose produces profits by delivering high pressures under the severest man-handling, cutting and chafing conditions encountered on any job.

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January 1958—CONSTRUCTION METHODS and Equipment—Page 113

# *Now—a new "quick-shift" for construction giants*



## **New Allison TORQMATIC 5840 FourSpeed—the first "quick-shift" available for 400 horsepower engines.**

Here it is—available now—the Allison TORQMATIC CBT-5840 FourSpeed. This new Transmission outdates—for the first time—old-fashioned, piece-and-patch power trains in "giant" giant earthmovers, loggers and other heavy-duty construction equipment with engines up to 400 h.p. And, the new TORQMATIC CBT-5840 FourSpeed is specially designed in one compact package to provide maximum capacity in minimum space.

New high-capacity TORQMATIC Converter multiplies engine torque more than 313%—prevents engine lagging—slashes power-train and engine maintenance.

New long-life planetary transmission eliminates clutching and declutching. It *full-power shifts* in all four speeds for faster round trips—makes every driver an expert.

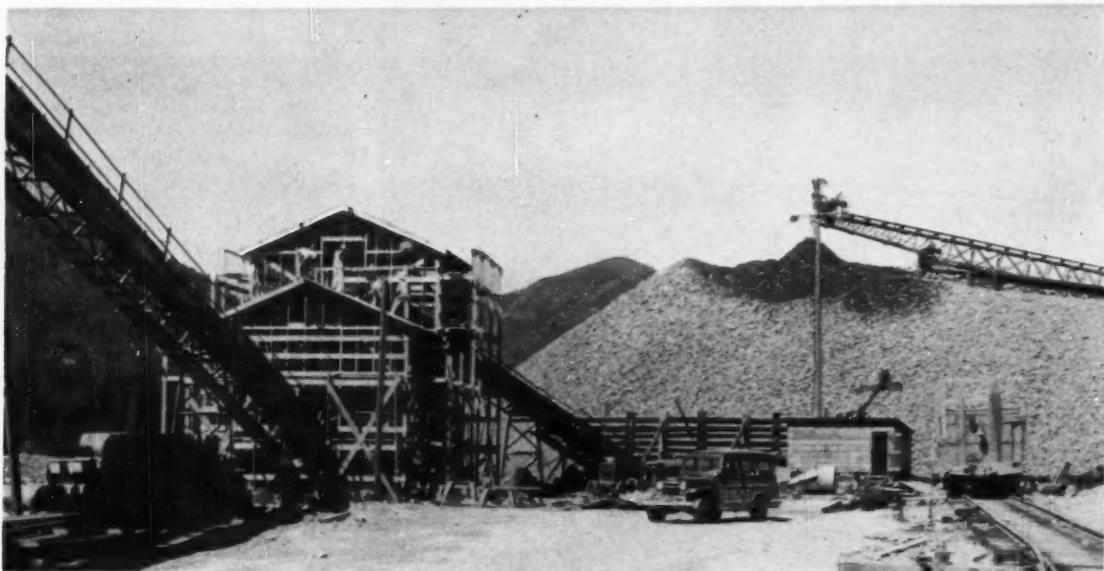
New integral Hydraulic Retarder with weight-saving aluminum impeller takes the load off your mind—permits faster, safer descents on even the steepest grades—cuts brake maintenance more than 50%.

TORQMATIC DRIVES have brought greater workability and lower operating costs to 122 different types of road-building and construction equipment made by more than 80 manufacturers. Take the tip—get the Allison TORQMATIC story. See your equipment dealer or write:

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**Allison**  **TORQMATIC® DRIVES**

## SCRAPER FLEET BUILDS WING EMBANKMENT . . . continued from page 111



**CLEANING AGGREGATES**—Crushed stone is run through this washing and rescreening plant located between the aggregate stock-

pile and the batch plant. Conveyors carry the aggregates from stockpile to rescreening plant then to concrete batch plant.

by tractor-drawn sheepsfoot rollers that make several passes.

Scrapers also place upstream and downstream sand filter zones over the core. These have a 15-ft top width. Cores and filters are protected by a sand and gravel shell with relatively flat 3 on 1 outside slopes.

Shell material for the north embankments comes mainly from stockpiles of material excavated during stripping of the embankment area to bedrock. Shell material for the south embankment comes from a borrow area 300 ft from its upper end where haul is downhill.

Bottom dump trucks place a 3-ft rip-rap blanket over 12 in. of select bank run gravel on the upstream slopes.

A two-stage cofferdam system diverted water for the project. The first cofferdam was thrown around the spillway area and the north side of the river during the 1956-57 low water season to divert the water along the river's south bank where the powerhouse will be located.

When all of the spillway except for four upper middle blocks was completed just before the 1957 high water season, the cofferdam was breached and water was diverted through eight sluiceways that pierce the lower middle blocks.

continued on next page



**BATCHING CONCRETE**—Batch plant turns out a 2,000-psi mix for mass concrete and a 3,000-psi mix for face concrete. It discharges into dinkeys that haul concrete to pour site.



**DIGGING FOR POWERHOUSE**—Manitowoc Speedcrane mounting a dragline bucket removes overburden at powerhouse excavation. Some rock is processed for aggregates.



**REMOVING BEDROCK**—Northwest shovel loads fractured rock into a Euclid dump truck. Contractor also uses the trestle-mounted cranes to supplement shovels in excavation.

### SCRAPER FLEET BUILDS WING EMBANKMENT . . . continued

Concreting of the remaining portions of the spillway should get under way early next year. Concrete is batched from an automatic plant with two 4-yd mixers set up 500 ft from the spillway area.

A subcontractor produces aggregate for the plant from a riverbed deposit where a crushing plant is set up. The crushed stone is hauled to storage piles alongside the plant. Before batching it is run through a washing and

rescreening plant between the aggregate stockpile and the batch plant.

The batch plant turns out two separate mixes: a 2,000-psi mix for concrete and a 3,000-psi mix for face concrete.

The batch plant dumps concrete into 4-yd buckets on railroad flatcars. Diesel-powered dinkeys pull flatcars over a 938-ft construction trestle 105 ft high that spans the river adjacent to the downstream spillway face.

Designed by M-K engineers, the trestle mounts two revolving cranes each with 155 ft of boom. The cranes can make 11-ton lifts at flat boom and 35-ton lifts with boom set at 75-deg angle. Besides handling concrete, the cranes do all other required lifting at the job.

Normal concrete lifts for the spillway are limited to 5 ft, with a 72-hr time lapse between adjacent lifts and 96 hr between successive layers. Because of the time lapse and the limited quantities used, little is done to cool the concrete. Cooling amounts to sprinkling the aggregate stock pile and leaving water standing on top of the mass blocks after a lift has taken its initial set.

### First Generation

The eight sluiceways will take the low water flow during construction of the spillway to full height. Early in 1959, drop gates will plug the sluiceways to bring water up to spillway level. First generation is expected in September, 1959.

After the breaching of the first cofferdam, a second cofferdam was thrown around the south bank to dry the area for powerhouse construction. Some 135,000 yd of fill went into this stage. The dikes were made by dumping large rock from a nearby bridge and filling behind with smaller material.

The cofferdam, though, is not watertight. To keep it dry, M-K set up a substantial pumping installation with a 160,000-gpm capacity in full operation. Biggest pump has a 400-hp motor and can move 26,000 gpm at a 65-ft head.

Powerhouse excavation, now getting under way, will be brought down to bedrock. The contractor hopes to build up the structure enough this season to prevent its overtopping during next year's high water flow. When this phase is completed, the entire 1958 high water flow will pass through the eight sluiceways and over the low spillway blocks.

The dam is a project of the Washington Water Power Co. Project manager for M-K is George Piedmont. L. B. True is project engineer. M-K's portion of the work amounts to \$21 million. Chicago Bridge & Iron Co. holds a separate contract for fabrication and installation of penstocks.



**Dozing—But Never Dozing Off.**  
Moving earth for new Interchange north of Washington, dozers average 3000-4000 hrs. before overhaul using Cities Service C-300 Motor Oil!

**Greene in Name Only.** Veteran construction man Ralph Greene is one of Washington's largest earth movers. He refuses to baby his trucks. With Cities Service lubricants they can take it!



**At work on new Interchange:**  
**Greene & Dyer, Inc., Washington, D. C.**



## Trucks go 7000 hrs. without overhaul— Shovel chalks up 8500 hrs.

### **Big earth mover strikes paydirt with Cities Service Products**

In the past year, Greene & Dyer, Inc. has moved 1½ million yards of earth in building an Interchange for the new road system north of Washington, D. C.

To do it, President Ralph Greene has kept his trucks, dozers and shovels running constantly under grueling mud and dust conditions. For, as he says: "We're in business to move dirt, not to baby trucks."

Nevertheless, Greene's equipment is rolling up one record after another, using Cities Service

C-300 Motor Oil and Cities Service fuels and greases.

Dozers are getting 3000-4000 hours before overhaul. Trucks are rolling up 65,000 miles—or about 7000 hours each. And one shovel has gone 8500 hours with no overhaul yet needed.

Says Greene: "That's proof enough for me that Cities Service products are the best I can use. I'd recommend Cities Service to anyone whose work demands fuels and lubricants that can take it."

**CITIES SERVICE**  
QUALITY PETROLEUM PRODUCTS

## Standard TRAILER COMPONENTS HAUL Special TOLL ROAD EQUIPMENT

Only Talbert Trailers® offer you a complete choice of basic interchangeable trailer components to handle all types of loads quickly, easily—and, with weight properly distributed over all axles to meet highway load restrictions.

Hauling heavy loads and moving big toll road rigs is "duck soup" for Talbert Trailers. Their unique ability of interchanging a variety of deck sizes and types to meet specific load conditions is exclusive.



Talbert Flat Decks, Raised Center Decks, Beam Decks and Drop Side Decks may be interchanged at will using the same Talbert Removable Gooseneck\* and Removable Rear Axle Assembly. Interchangeability also facilitates the proper positioning of load to correctly distribute weight over all axles.

### Red Top Trucking "tames" Euclid Scrapers using Talbert Trailers.®



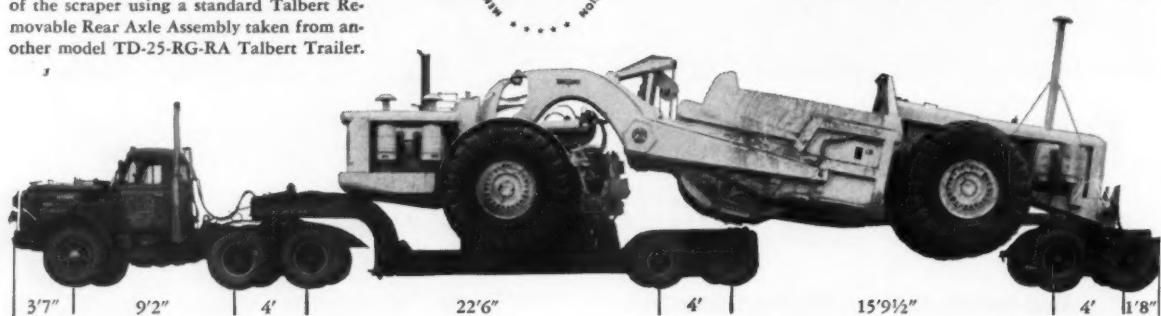
Red Top Trucking of Hammond, Ind., makes "quick work" of hauling Euclid S-18, TS-18 and TS-24 Scrapers. A Talbert 13 foot deck insert in one of their Talbert Model TD-25-RG-RA 25-ton Trailers allows weight to be transferred forward to the tractor tandem. Pictured above is the unique way Red Top supported the rear axle weight of the scraper using a standard Talbert Removable Rear Axle Assembly taken from another model TD-25-RG-RA Talbert Trailer.



After raising scraper rear over tandem axle unit, chain from lashing rings secures load to Talbert Removable Rear Axle Assembly.



With the Talbert Removable Gooseneck\* disengaged from the interchangeable 13 foot deck and with outriggers extended, prime mover is correctly positioned on trailer deck allowing proper weight distribution over all axles and clearance between lead trailer and supporting rear tandem. Talbert Gooseneck\* is then replaced and rig is ready to roll.



Axle No.	1	2 & 3	4 & 5	6 & 7
Supported Weight	8,340#	35,220#	33,950#	31,950#
No. of Tires and Sizes	2 10.00 x	8 10.00 x	8 10.00 x	8 10.00 x
	20	20	15	20

Weight data shown are actual scale weights certified July 1, 1957.

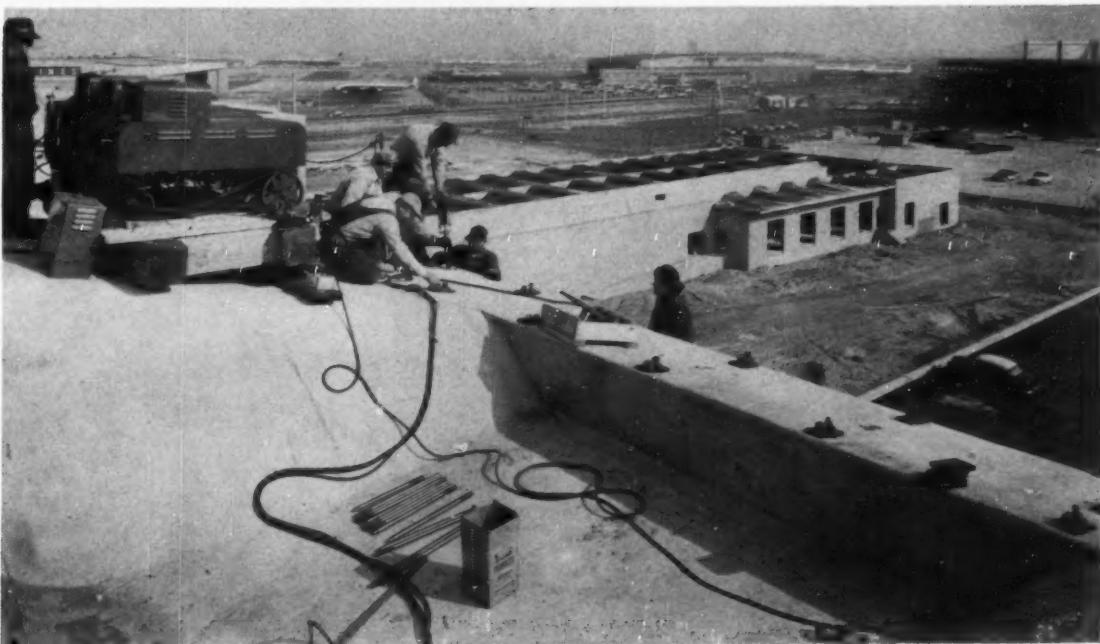
The chart above clearly shows exactly how weight is properly distributed over all axles. If you like this kind of load handling ease, contact your Talbert Trailer Distributor for the whole Talbert story—or write for detailed catalog information covering the complete Talbert Trailer line in models ranging from 10 to 120 tons capacity.



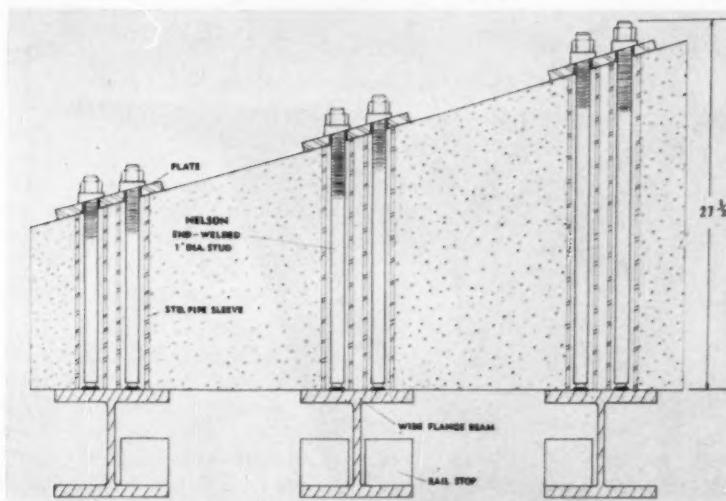
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**POWER SUPPLY**—Three Nelwelder units charged by a portable generator permit workmen to stud weld at any point along 670-ft roof, eliminating central power station.



**ROOF TAPERS**—Studs are welded to WF beams through concrete and held with nut at top. Stud lengths vary from 17½ in. to 27½ in. as concrete roof tapers toward the tip.

## Studs Anchor Rails Under Concrete Roof

*By substituting a stud welding method for throughbolts a contractor on a suspended roof hangar cuts in half the time needed to anchor three rails to underside of roof.*

**GRANULAR FLUX - FILLED** threaded studs, end welded through precast holes in concrete slabs, will save half the time estimated for securing overhead door rails for a suspended roof hangar at New York's International Airport.

That's the time saving expected by Charles Prokop, vice president of Corbetta Construction Co. of New York, contractor for the new Pan American Airways hangar now nearing completion.

Part of the job calls for anchoring three WF beams in parallel rows to the underside of each hangar roof at its tip to serve as rails for hangar doors. The doors will ride between these and three rails set on the hangar floor.

To secure them, normal procedure would involve drilling holes in the steel beams corresponding to holes precast in the concrete roof. Throughbolts slipped through the holes would connect the beams and anchor them to the roof.

Stud welding eliminates three steps: (1) marking hole locations in the beams; (2) drilling bolt holes in the beams; (3) lining up holes in concrete and beams.

The contractor uses Nelson 1-in-dia studs with  $\frac{3}{4}$ -in. weld bases in sizes varying from 17½ in. to 27½-in. The 27½-in. studs are among the largest ever used. Different lengths are required be-



**MODIFIED GUN**—Welder fits 1-in.-dia stud to Nelson NS-9 welding gun with special tube attachment that holds the unusually long studs firmly while they are being welded.



**WELDING STUDS**—Sleeve on gun fits down through hole cast in roof tip.

### STUDS ANCHOR RAILS...

*continued*

cause the cantilevered roof tip varies in thickness, and two studs are needed at each rail-connecting point.

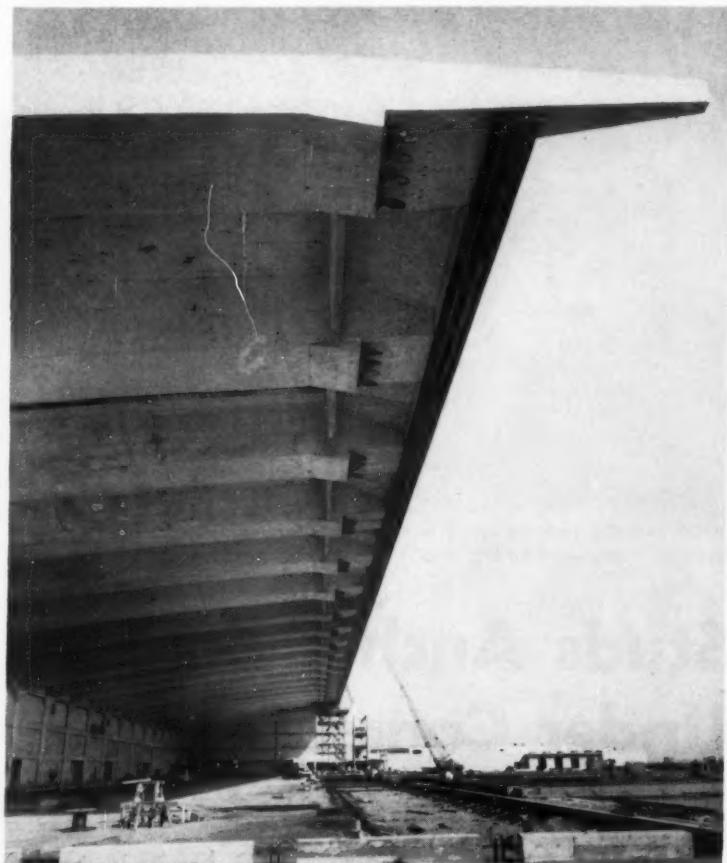
The studs are end welded through the roof to the steel H-beams that temporarily are held in place on the underside of the concrete.

A special tube fastened to the end of the extra duty Nelson NS-9 stud welding gun provides a platform that holds the unusually long studs while they are being welded. The tube both holds the ferrule in place and insulates the stud from steel pipe liners placed in the holes in the concrete.

Welding power is completely self-contained permitting stud welding at any point along the 670 ft of roof without need of a fixed central station power outlet. A portable generator, driven by gasoline engine, supplies 110 volts of ac current that charges the batteries of three Nelwelder battery units. Connected in parallel the battery units supply between 1,500 and 1,700 amp of total dc power to the stud welding gun.

Once studs are welded into place, nuts are run from the top of the roof down the stud threads to permanently anchor the beams.

Ray Vitolo is superintendent.



**ANCHORED RAILS**—Completed section of roof shows the stud-anchored rails in position. Doors will ride between rails on roof and rails that will be set into hanger floor.



## "FAST TRIGGER-ACTION CONTROLS almost double our loader output!"

"I'm really amazed at the speed and ease of maneuvering this big 1½-cu. yd. Case® TerraTrac® '800' tractor-shovel," reports Contractor Robert Leslie, New Kensington, Pa. "Because of its trigger-action hydraulic shifting and steering — plus higher reverse speeds — I am able to complete TWO cycles for every ONE made with my former crawler rig."

### Counter-rotation pays off

Leslie, who operates a sizeable spread of equipment in his general contracting business, finds that torque-converter drive and hydraulic Terramatic transmission pay big dividends in basement and roadway excavation. "My 1½-cu. yd. '800' has surprising power for tough digging," he says. "Furthermore, the ability to drive one track forward and

the other *reverse*, at the same time, makes it easy to finish sidewalls and square-off corners, without the usual backing and jockeying for position."

### "Operator's dream"

"Visibility for the operator is perfect," says Leslie. "I can see both sides of the bucket and tell exactly where I am cutting. It's also easier to get on and off the tractor, without climbing over a mass of levers."

See and compare the easier-handling 1½-cu. yd. Case TerraTrac tractor-shovel at your Case Industrial Dealer's today. Or mail handy coupon for details on other sizes suited to your needs and budget.

*Clip...mail for free catalog*

**J. I. CASE CO., Dept. A1498, Racine, Wis., U.S.A.**

Send catalog on crawler-mounted Tractor-Shovels checked.

2 yd.    1½ yd.    1 yd.    ¾ yd.    ½ yd.

Name..... Title.....

Company.....

Address.....

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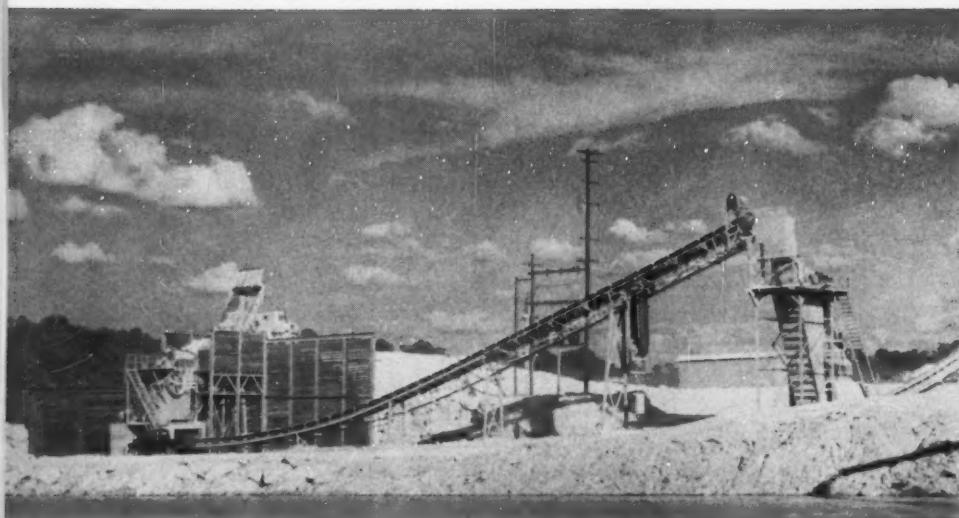
CT-L-93



"My '800' gets much better traction than other loader-tractors in these Pennsylvania hills," Leslie reports, "because the torsion-bar suspension enables both tracks to oscillate up and down over irregular ground. This also means less strain on the track-frame and equipment — and a lot smoother ride for the operator."



1st in quality  
for over 100 years



**LOADING**—Starting point in new 500-tph Princeton, N. C., plant, largest in Teer's system, is loading ramp at this end. Trucks bring rock from adjacent quarry operation.

**CRUSHING**—From trucks, rock goes through a 42x48-in. jaw crusher at left of the long conveyor. Conveyor carries it to 5½-ft Symons cone crusher (above).

**SURGE PILE**—From second crusher rock goes to surge pile. Pile evens production and permits quarry and first two crushers to run independently of delivery end.



## Roadbuilder's Quarries Assure

GETTING AGGREGATES is going to be a problem for a lot of contractors over the next few years as highway building picks up. Roadbuilders who always have been able to buy aggregates may find it necessary to produce their own—or pass up some jobs.

The interstate system alone will require \$6 billion worth of aggregates. Chances are, overall demand for roadbuilding aggregates will double in the next 2 or 3 years.

### Looking Ahead

Most contractors don't worry about getting aggregate until they actually need some. But one outfit, the Nello L. Teer Co. of Durham, N. C., is doing some advance planning.

They have gone into the quarry business in a big way and are accumulating plants and experience that should assure them of a dependable supply of aggregates in the future. Since July, 1956, they have set up five permanent plants, and more are on the way.

Not every contractor can match Teer's program. But any roadbuilder who is looking to the future can learn something from their approach.

### Fast Growth

The Teer outfit is one of the major highway builders in the United States, but they didn't start making their own aggregates on a big scale until 1950. At that time the state of North Carolina, which is Teer's home territory, greatly enlarged its program of highway building. Teer figured that the total aggregate capacity in the region could not supply enough material for the program.

So they set up a plant in Durham, N. C., capable of turning out 250 tons of rock per hr. On the same site they put up an asphalt plant.

The aggregate plant impressed a large Maryland buyer so much that he asked Teer to set up a similar plant at Laurel, Md., and guaranteed a market for the aggregate for three years.

That was how it started. After these two plants had been in operation for a few years, Teer people found they were producing aggregate cheaper than they could buy it—and were making a profit on the plants, too.

This discovery touched off the explosive expansion of the quarry division in 1956. Today the

division employs 250 men and is one of the major aggregate suppliers in the region.

Threefold expansion in a year is enough to cause severe growing pains in any organization unless it is well handled. Teer has had no trouble because, in spite of the fast growth, each move was planned carefully.

### Market Analysis

The first move in picking a site for a new quarry is to estimate the sales potential in the area.

This is a tricky job, and Teer realized early that it pays to have an expert making the decisions. Last year they brought Rex H. Champion into the organization as sales manager of the quarry division.

Champion, with many years of experience in the business of marketing aggregates, is an expert at measuring market potential. His formula seems to be working well for Teer.

One of the first factors he looks at in an area is present consumption versus density of population. He has found that there is usually a predictable relationship between the two. But population ratios are just the beginning.



**FINE CRUSHING**—Two 4-ft Telsmith cone crushers are followed by sizing bins. A return conveyor carries oversize rock from bins back to crushers for reprocessing.

**WASHING**—Final step is washing aggregate and sorting it for immediate delivery or into stock piles. Wash water is cleaned through two settling basins and re-used.

## Ample Supply of Aggregates

They can serve only as a rough guide because figures for a given area may vary widely from the average.

The company also keeps up-to-date records of all aggregate sales and prices in regions where they are active. The amount of construction work currently going on or proposed is important, too. Teer set up the Princeton, N. C., plant largely because the company won a contract to supply 235,000 tons of rock for a housing project at the Seymour Johnson Air Force Base. Usually, though, one job is not enough to justify a permanent plant unless there is a continuing market for aggregate in the area.

And transportation must be considered. Trucks are economical within a 20-mi range of a quarry. If the company plans to sell beyond that, they need rail connections—a spur from the quarry to a main line.

### Picking the Site

The key factor in selecting a site for a plant is the quantity and quality of the rock available there.

Teer takes great pains to test the rock thoroughly because they know that spending a few extra

dollars at this stage to get the right answers can make the difference between the success or failure of the whole operation.

The company has a full-time geologist on its staff. His job is to locate sources of rock and make complete tests at a site before final selection.

He makes borings to determine quantity. It is not economical to set up a permanent plant unless

there is enough rock on the site to last 5-10 yr. Teer would prefer a 15-yr supply.

The quality is just as important. The market analysis shows what specification of rock is needed in the area. Then the geologist carefully tests the rock at a proposed site to make sure it meets these specifications.

Teer policy is to be conservative in evaluating first tests. This



**KEY MEN**—Sales Manager Rex H. Champion (left) and Assistant Sales Manager W. Harris Lawson (right) handle the marketing and sales promotion for the aggregate division.

## ROADBUILDER'S QUARRIES . . . continued

means that they usually end up with at least the results they figured on. And sometimes they get much more.

At New Bern, N. C., tests showed that the rock was OK for most highway aggregates, and the plant was set up on this basis. After it started operations, much of the rock proved to be of superior quality and was sold for surface treatment work at a higher price.

Water supply is essential at a

quarry site. Teer uses several sources. At their Durham plant, there was no large natural source. But they were able to clean out an adjacent low-lying area to form a six-acre artificial lake that supplies all needs.

At the Raleigh plant, the water comes from a privately owned lake on a neighbor's property. The plant uses the water in its washing process, then cleans it through two settling basins and returns it to the lake.



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Overburden may or may not be important depending on how much there is and what it consists of. The geologist always tests it to find out.

Sometimes overburden can be an asset. Walter Dean, superintendent of the big Princeton plant, doesn't like to throw things away. He figured he could find some use for the rocky overburden.

So he put it through the plant and cleaned it. He ended up with a pile of low-grade stone, not acceptable for highway work. It stood in a stockpile for months until the sales department found a buyer who wanted some cheap rock fill. The price was low but it covered the entire cost of stripping and processing the overburden, normally a complete loss.

A final item to be settled before a site is chosen is property rights. Teer may buy the site outright or lease it from the owner on a royalty basis.

The company prefers a royalty lease because it usually is cheaper and it also helps to hedge against low sales. That is, the company has to pay only for the rock it sells. Should a quarry not live up to expectations, the company is not saddled with high payments or ownership of useless land.

This system works out pretty well for the owner, too. If the quarry is successful, as it usually is, he shares in the earnings.

### Building the Plant

Production men take over once the site has been selected. R. Glen Moore, superintendent of the quarry division, has handled the building of most of Teer's quarries.

If the future market for a quarry seems certain, Moore sets up a permanent type plant right away. This was the case at Princeton, where the first 250,000 tons of rock already were committed to the air base job.

But more often he starts with portable equipment. This allows the plant to get into production faster. As soon as the marketing pattern becomes clearer, he can convert to a permanent plant, designed specially for that location.

If something should go wrong and the market does not develop as expected, it is easy to move the portable equipment to another site.

continued on page 129

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fully the basic terms of diameter, construction, lay, grade and core . . . all necessary in understanding wire rope nomenclature. Many pictures of equipment at work also help the reader to visualize how recommended wire ropes are used on the job.

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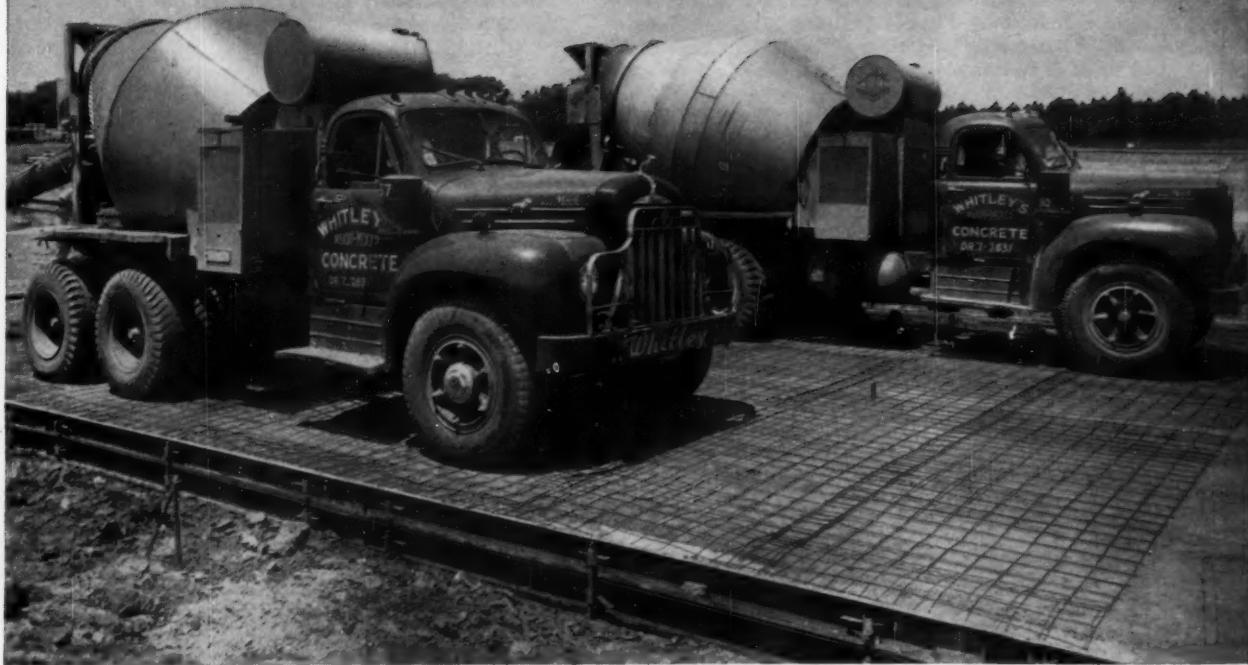
"Our 33 Macks are the main reason why we are able to give our ready-mix customers the best possible service at the least possible cost," says Mr. Grover Whitley, president of Whitley Construction Co. of Decatur, Georgia. Adds Mr. Whitley, "The extra strength and low maintenance built into

## Macks have significantly



Whitley has eight of these 4-wheel Macks with 4-yard mixers for use on its smaller jobs, such as this residential construction. These Macks perform so economically and stand up to wear so well that Whitley has four more on order.

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Two of Whitley's 25 Mack 6-wheelers pouring concrete at roadway construction site. Each of these Macks carries a 5½-yard mixer. Whitley has found that Macks carry these back-breaking loads with ease and dependability, at minimum operating cost.

## reduced operating costs...

"Beating the problem of high operating costs was impossible for us until we bought our eight Mack 4-wheelers with 4-yard mixer bodies," says Mr. Whitley. "In past years, we have used all makes of trucks in the lower price class for use on the smaller jobs, but maintenance and operating costs were excessively high."

"Our business furnishes concrete for residential and commercial construction, which involves our trucks in both heavy city traffic and off-highway travel. Steep grades are frequently encountered, and on foundation pours the terrain is often very rough and the mud deep—conditions which do not make for low-

cost operation.

"Yet, with an annual mileage of 30,000 miles (an average of eight trips per day), down time is negligible, maintenance is low, thanks to Macks' superior construction. For profitable operation, these Macks top all our other trucks. In fact, we believe that our reduced costs of operation are due mainly to our use of Macks!"

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For the large pours, Whitley Construction Co. operates 25 Mack 6-wheeler mixer chassis, again with top operating economy and little down time. The extra strength built into the chassis and sheet metal of all Macks pays dividends in extra

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## Two New High-Capacity Asphalt Plants Announced by Barber-Greene

These two new continuous asphalt plants give greater versatility than ever before available. The same mixer, without alteration, may be used with any combination of plant components to produce all types of mixes—from the simplest cold mixes to the highest types which must meet the most rigid specifications. Model 847 is for high capacity. Model 848-A is for extra high capacity.

It is only necessary to transport and operate the components required for the job:

For cold mixes: Mixer + calibrated feeder

For intermediate hot mixes: Mixer + calibrated feeder + dryer

For high-type mixes: Mixer + gradation unit + dryer



Plant with four-bin gradation unit for production of highest type mixes. This multiple-aggregate plant is available in both sizes.



Cold-mix plant, available in both sizes, consists of mixer and calibrated feeder. Dryer and gradation unit may be added later.

### Both models offer these advantages:

- Unequaled versatility as described above.
- New hydraulic clamshell discharge gate saves truck time, prevents segregation.
- Transfer pump assures constant head of asphalt for metering pump, eliminates need for asphalt storage tank on mixer.
- Interlocked aggregate and asphalt feeds assure constant, correct proportioning.
- Truck pit no longer required.
- Highly portable plant components allow fast travel between jobs, pay off in more days of operation per season.
- Erection is merely a matter of spotting the units at the plant site and dropping the jacklegs.
- New, easier calibration of single-aggregate and cold-mix plants.

57-12-A

Write for information on these two new flexible high-capacity asphalt plants.

**Barber-Greene**



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CONVEYORS...LOADERS...DITCHERS...ASPHALT PAVING EQUIPMENT

It takes about eight months for a quarry to start making a profit and nearly a year before it reaches its full production capacity. One reason for the delay is that it takes time to strip the overburden and prepare the site. Another is that sales build up slowly.

The biggest reason is simply that it takes time to iron out the bugs in a complicated network of machinery. Experience helps, and Teer is accumulating plenty of that. But each new quarry has unique problems, and no standard formula can solve them all.

The quarry division likes to get a plant up to capacity as soon as possible, but they are willing to experiment at the beginning to get the most effective layout. This means several unprofitable months. But eventually it pays off with a highly efficient layout.

Conveyor systems and bypasses offer the most scope for increasing output. Moore tries to set them up to get the greatest flexibility in his end products and, at the same time, achieve the most efficient crusher production.

#### **Drilling and Blasting**

Teer has found shallow face drilling to be most effective in the rock they have encountered to date. Twenty-four feet is the usual depth of face per lift.

They use a comparatively small 3½-in. hole at 7 to 9-ft spacing. This requires more explosive than larger holes at wider spacings but produces better fragmentation.

A 24-ft drill hole carries about 19 ft of dynamite with 5 ft of earth stemming in the top part of the hole. Teer experiments with different kinds of dynamite but generally uses Atlas Giant 40% gelatin.

The size of the shot depends on whether the plant needs rock in a hurry or not. Ordinarily, crews work about 7 days to set up 20,000-25,000-ton shots.

As an operating objective, 2½ tons of rock per lb of dynamite is considered good production. When output drops below this figure, as it might in a new quarry, drilling patterns and hole sizes are adjusted to give a more efficient shot.

Good blasting techniques keep large boulders to a minimum. When secondary breaking is required, Teer uses a 5,000-lb drop

ball. This is more economical than a jack hammer or drilling and blasting because the crane is on the site anyway, its main function being to handle washed screenings in the settling basins.

The largest plant in the division, and perhaps the largest producer in North Carolina, is near the village of Princeton.

The plant has 1,300 ft of conveyors and five crushers in a permanent setup to turn out 500 tph of processed rock.

A 4-yd Marion shovel and four 22-ton Euclid end dumps move the rock from the quarry to the crusher. A fifth Euclid is on hand as a spare in case of a breakdown.

Dean thinks the extra truck pays off even though it is idle much of the time. If the plant has to slow down because there aren't enough trucks to keep it supplied, the company loses profits. It wouldn't take long to lose the cost of the extra truck.

*continued on next page*

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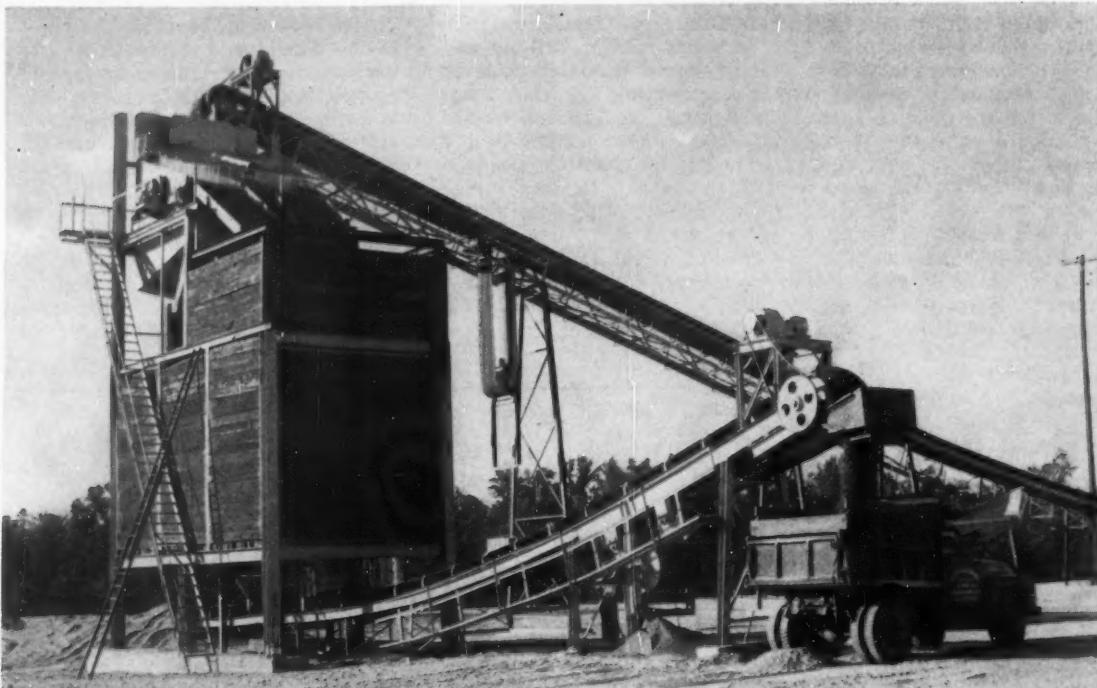


Power Take-Offs



Speed Reducers

**C L U T C H E S**



**DELIVERY**—At the Princeton plant, a combination of three sizing bins and a loading conveyor permit flexibility of delivery. A three-

size mix can be delivered on the conveyor for a waiting customer's truck or single sizes can be sent to stockpile.



**PORTABLE PLANT**—Teer set up this portable crushing plant at the North Carolina state fair last year to acquaint the public with

their quarry operations. Ordinarily the three-crusher, 250-tph plant is part of the new quarry operation at Raleigh, N. C.

This thinking is characteristic of Teer operations generally; they aren't afraid to use plenty of equipment. A quarry may use two 900-cfm compressors to power four drills. They figure it cuts downtime and maintenance costs to work machines at a comfortable pace instead of overloading them.

Gardner - Denver Air - Tracs handle the drilling at Princeton and have no trouble with the shallow faces.

There is a large stockpile area near the plant, but aggregate can be mixed right off the assembly

line if necessary. Three bins at the end of the washing unit all feed onto a single conveyor. The conveyor leads to a truck loading platform. By feeding different amounts of stone from the three bins onto the conveyor, a specified mix goes into the trucks in a few seconds.

The plant is powered by electricity bought from a local power company. But in some cases, the company finds it cheaper to generate its own power. At the Durham plant, two 295-kva Caterpillar generators do the job.

The quarry at Raleigh, N. C.,

is a good example of how Teer starts off an operation with a portable plant.

This plant is one of the largest portable layouts in the country with a capacity of 250 tph and a wide variety of end products. Three crushers, instead of the more-usual two, provide flexibility.

All the major components are Telsmith units. A 42-in. wide by 40-ft long portable apron feeder carries the rock from the quarry trucks to the first crusher. This is a 30x42-in. primary portable jaw crusher. Next in line is a

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## ROADBUILDER'S QUARRIES . . . continued



**SURGE PILE**—Rock from the first two crushers at the Princeton plant feeds into this surge pile. The pile evens quarry production, makes it less dependent on sales demand.

Telsmith 489 single-pass portable scalping and crushing plant. The last unit is a 48-in. fine crusher.

Telsmith finishing screens and storage bins are used, and a large capacity portable conveyor connects the units.

It takes 34 men to operate the Raleigh plant. During the summer it runs six days a week, 10 hr a day. In the winter, they cut back to 8 hr.

Teer finds one-shift operations work best in a quarry. A night shift is expensive, and the split in responsibility leads to slipshod work. When demand gets heavy, they extend the one shift to a 12-hr day and pay overtime. They say this is cheaper and more effective than a second shift.

The only thing lacking at Raleigh for a complete aggregate plant is sand. Teer has solved this by bringing sand in from nearby pits and stockpiling it.

To do this economically, they use their regular stone delivery trucks. The trucks do not make special trips, but whenever they are returning empty to the quarry and have an opportunity to pick up sand, they do so. Gradually the stockpile has built up, and Teer now can offer a complete variety of aggregate combinations from its Raleigh plant.

The plant has been in operation for a year, and the company is planning to replace the portable unit with a permanent plant.

### Marketing

The sales department is important to a quarry operation. Big orders may be handled like a

construction project—open bidding by suppliers with the contract going to the lowest bidder. A job like this is mainly an estimating problem.

But much of the business comes from smaller buyers in the area who come to the quarry to purchase aggregate. Attracting this type of business calls for active publicity and a good sales staff. This is the job of Rex Champion and his assistant sales manager, Harris Lawson.

The company carries on an active public relations program to make the public aware of its service. Probably the most outstanding event in the program occurred in October, 1956, at the North Carolina State Fair. Teer's quarry division made a dramatic public debut by moving the entire Raleigh crushing plant to the fair as an exhibit (CM&E, November, 1956, p 53). Many people saw a crushing plant in operation for the first time, and the sales effort got away to a flying start.

Also effective is Teer's TV advertising. The company reached a great many people by sponsoring such popular TV events as the University of North Carolina's participation in the NCAA basketball tournament and coverage of the 1956 presidential election.

The division keeps large stockpiles of rock at its quarries. This serves a double purpose. Deliveries of rush orders can be made immediately. And stockpiles level out production schedules because large orders are filled from the stockpiles without overloading the plant.

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**Oil Pipe Hauler:** "We haul 42,000 lbs. net payload of oil-field pipe over mountainous terrain. In the first 6 months of operation of our INTERNATIONAL V-8 truck we have had no engine expense, average 5 to 5½ miles per gallon of gas!"



**General Contractor:** "My INTERNATIONAL V-8's have outperformed every competitive make under any and all conditions. We are most happy with the model VF-190A dump . . . I would recommend it to anyone using 8-10 yard dump trucks."



**Steel Hauler:** "We average 40,000 lbs. of steel per load. Trips range up to 125 miles with a lot of stop-and-start driving. With our INTERNATIONAL V-8 there's less shifting on hills, it holds speed better, makes better time, keeps up with traffic."

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## **Construction Men in the News . . .**



E. L. COFFMAN is the new construction manager for F. H. McGraw Co., New York engineers and constructors. Coffman formerly was the company's project manager during the building of a pilot plant for Olin Mathieson's chemical division at Niagara Falls, N. Y.

In his new post, Coffman will take charge of McGraw's structural operations and administration. He also will help establish policies and procedures governing the company's field construction operations and methods.

Before joining McGraw in 1956, Coffman was process construction division superintendent for Peter Kiewit Sons' Co. on the large Portsmouth, Ohio, atomic energy plant. He has been in construction for 28 years.

**EDWIN R. AKERS** succeeds George P. Seeley as president of The Frederick Snare Corp., New York contracting engineers. Seeley becomes assistant to the chairman of the firm's board of directors. John F. Myslik also succeeds Harry O. Ware as secretary and treasurer. Ware is retiring.

Akers formerly was senior vice president and has been with Snare for 38 yr. During this time he headed many of the company's construction operations in the United States, Cuba, Venezuela, and other Latin American countries. Myslik formerly was assistant secretary and assistant treasurer. He has been with the company 21 years.

**HERBERT C. SAVIN** of Savin Bros., Inc., New Haven, Conn., will serve a second term as chairman of the Connecticut Labor Relations Division of the New England Road Builders Association.

He was reelected at the division's annual dinner. Other officers elected are Paul E. Blouin of Lane Construction Corp., treasurer; and Robert N. Blakeslee of C. W. Blakeslee and Sons, Inc., secretary.



**N. D. (Dan) TETERS**, construction manager for Atlas Constructors on the complex USAF bases in Morocco, has been decorated by the government of France with the "Cross of the Legion of Honor." The decoration was given him for his contribution to the security of NATO by his work on the complex project.

Under his supervision, starting with the crash program at the outset of the Korean conflict, the bases and related installations under the jurisdiction of the U.S. Army Corps of Engineers, were built in record time. One base was put into operation four months after ground was broken.

Teters presently is Resident Partner of Atlas on the Morrison-Knudsen-sponsored co-venture in Casablanca. Partner firms are Bates & Rogers, Ralph E. Mills, Blythe Bros., and Nello L. Teer. He also is a vice president of Morrison-Knudsen International Co., Inc.

**CLINTON B. F. BRILL** is New York Governor Averell Harriman's newly appointed Chairman of the New York State Thruway Authority, a post vacated a year ago when Bertram D. Tallamy became the nation's first Federal Highway Commissioner.

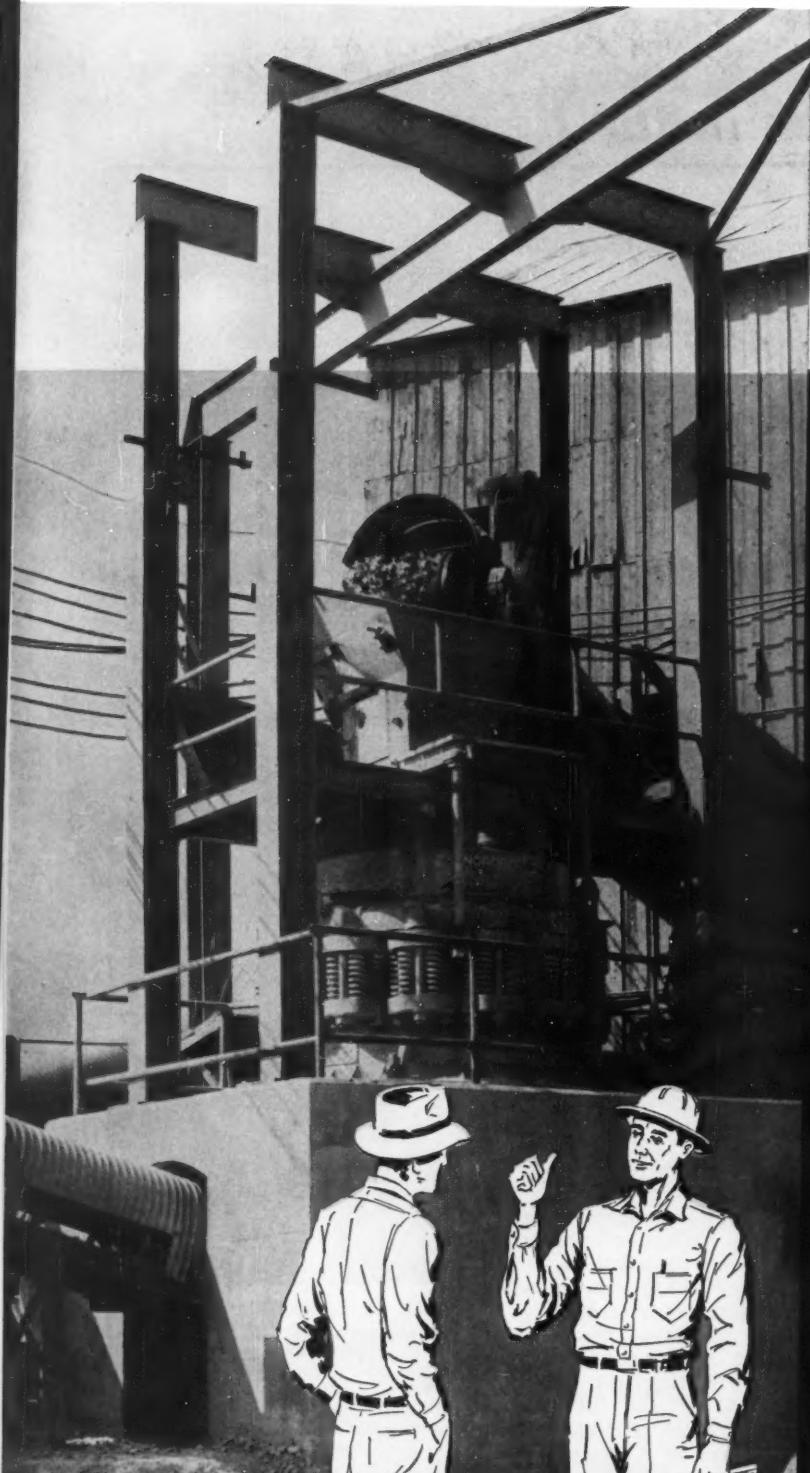
Gov. Harriman, in announcing the appointment, said that Brill "will serve as assistant to the governor" in connection with the state's construction program which includes buildings for state institutions. The post will include supervision of hospitals and schools.

A native of Mt. Union, Pa., Brill formerly was a partner in the New York consulting firm of DeLeuw & Brill. He had worked as an architect and engineer since 1926.



**CAL P. BAKER**, area manager for Mannix Co., Ltd., is president of the Heavy Construction Association of British Columbia. Baker, who has been with Mannix seven years, heads the 35-member association for the second year.

Other officials elected at the tenth annual meeting of the association held in Vancouver are: J. E. R. Wood, president of Northwest Construction Co., Ltd., first vice president; Frank Harman, president of Columbia Bitulithic, Ltd., second vice president; J. D. Layden, technical advisor to Major General J. P. MacKenzie, managing secretary.



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NORDBERG MFG. CO.

Milwaukee, Wisconsin

• Symons Crushers are designed and built to produce big tonnages of specification aggregate, bituminous mixes, sand and cement. Higher productivity at the lowest ton-hour cost are two of the sound operating advantages of Nordberg built crushers . . . from the Gyradisc® up through Symons® Cones and Primary Gyratories.

Every one of these crushers is soundly engineered and ruggedly built to provide today's re-

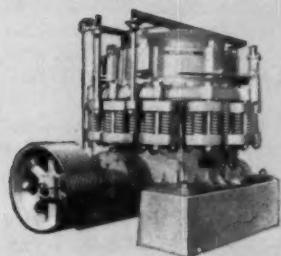
quired performance. Good reason why they are the outstanding choice of leading producers and contractors in the construction of highways, dams and hydro projects, bridges, as well as commercial and residential buildings.

Consult Nordberg soon . . . it will pay you to specify and use Symons Crushers for both stationary and/or portable service.

Write for descriptive literature.



SYMONS 42" GYRATORY CRUSHER



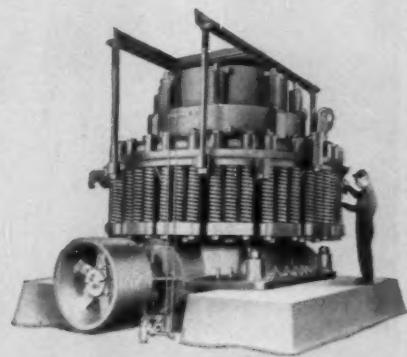
SYMONS 4' SHORT HEAD CONE CRUSHER

#### SYMONS PRIMARY GYRATORY CRUSHERS

(Left): These gyratory crushers are built for big tonnage, heavy duty primary breaking in 30", 42", 48", 54", 60" and 72" feed opening sizes, for capacities up to 3500 or more tons per hour.

#### SYMONS STANDARD CONE CRUSHERS

(Right): Standard Type Symons Cone Crushers are built for primary and secondary service in 6 sizes with crushing heads from 2' to 7' in diameter. Capacities in open circuit range from 15 to over 900 net tons per hour.



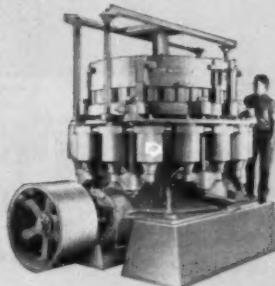
SYMONS 7"  
EXTRA HEAVY DUTY CONE CRUSHER

#### SYMONS SHORT HEAD CONE CRUSHERS

(Left): Short Head Type Symons Crushers are built for fine reduction. Offered in 5 sizes with crushing heads from 2' to 7' in diameter. Capacities up to 420 net tph in closed circuit operation, with greatly increased capacities in open circuit crushing.

#### GYRADISC® CRUSHERS

(Right): Built to supplement the Symons Cone Crusher, the 54" Gyradisc Crusher is providing volume production of still finer specification material, such as cag-lime, limestone chips, sand, rock dust, crushed stone for asphalt mix, and the fine reduction of asbestos and talc.



54" GYRADISC CRUSHER

#### FOR PORTABLE SERVICE

Increasing numbers of portable plant operators are now using Symons Cone Crushers for big capacity of fine product . . . such as the Cedarapids Model 4-ICS portable intermediate crushing plant utilizing a 4' Symons Cone Crusher, shown at the right.



© 1957, Nordberg Mfg. Co.

Q457



SYMONS  
VIBRATING GRIZZLIES



SYMONS  
VIBRATING SCREENS



NORDBERG  
GRINDING MILLS

NORDBERG ENGINES,  
10 to over  
12,000 hp



NORDBERG KILNS,  
DRYERS, COOLERS



# NORDBERG

MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

NEW YORK • SAN FRANCISCO • ST. LOUIS • DULUTH • WASHINGTON

TORONTO • MEXICO, D. F. • LONDON • GENEVA • JOHANNESBURG





**3 feet of frost...  
trench 5 feet deep...  
30 inches per minute**

**CLEVELAND TRENCHERS**, like Sunberg Well Company's Model 110 working here on the installation of 38,000 feet of 4-inch main in tough frost digging in DeSoto, Iowa, have for over 25 years delivered **more trench . . . in more places . . . at less cost.**

Clevelands are built by The Pioneers of the Modern Trencher, originators of every important trencher design feature. There's a Cleveland for every trenching job and you'll find them working everywhere, giving good reliable production on tough jobs as well as easy ones—and doing it for year after year.

**THE CLEVELAND TRENCHER CO.**

20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO



*Good  
Everywhere*

## **Sales and Service**

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distributors, sales personnel and other activities.

### **Distributor Appointments**

**Koehring Co.**: The Kwik-Mix Division has appointed the following six distributors: Contractors Supply Corp. of Englewood, N. J.; Malcolm G. Stevens of Arlington, Mass.; P. H. Machinery, Inc. of Duluth, Minn.; R & R Equipment Co. of Hillside, N. J.; The Olson Equipment Co. of Minneapolis, Minn.; and Industrial and Foundry Supply Co. of Oakland, Calif.

**Marion Power Shovel Co.**: The Waterloo Steel & Equipment Division of Zeidler Concrete Products Machinery Co. of Waterloo, Iowa, is now a Marion distributor for northern Iowa. They will handle  $\frac{3}{4}$  to 4-cu yd machines.

**Yale & Towne Mfg. Co.**: The Contractors Machinery Division has appointed the following three distributors for their Trojan line of tractor shovels: Inland Service and Supply Corp. of Las Vegas, Nev.; Swanston Equipment Co. of Fargo, N. D.; Costello Equipment Co., Ltd. of Calgary, Alta., Canada. The Materials Handling Division has appointed Col-Mer Co. of Columbus, Ohio, as a distributor.

**Worthington Corp.**: McIntosh Equipment Corp. of New York City has been appointed distributor of the standard pump and compressor line in the metropolitan New York area.

**Four Wheel Drive Auto Co.**: The following four distributors have been appointed: Wiley Equipment Co. of Atlanta, Ga.; Ray Long Equipment, Inc. of Columbia, S. C.; Motor Fleet Service Inc. of Indianapolis, Ind.; and J. D. Motor Service of Houston, Tex.

**Davey Compressor Co.**: Two new distributors: Blackwell Trucking



New Kenworth 803-B rear-dump truck  
with Fuller 4-speed Transmission hauls  
64-ton payloads.

## KENWORTH'S *new mountain movers* *feature FULLER Transmissions*

Probably the largest rear-dump semi being built today, Kenworth's 42' 2½" rock and ore mover is equipped with a Fuller heavy duty 4-speed Transmission.

The 228,000 lb. gvw Kenworth 803-B is designed to haul top payloads profitably over varied terrain. It is powered by a single 12-cylinder diesel engine, offered in either the 400 or 600 hp range. In the 400 hp version, illustrated, a Fuller 4-speed

4-MS-1440 Transmission with CO-11,500 Twin Disc Torque Converter delivers power efficiently and effectively from the powerful Cummins NHV series engine. These heavy-duty Fuller Transmissions provide the right gear ratios to apply the power profitably.

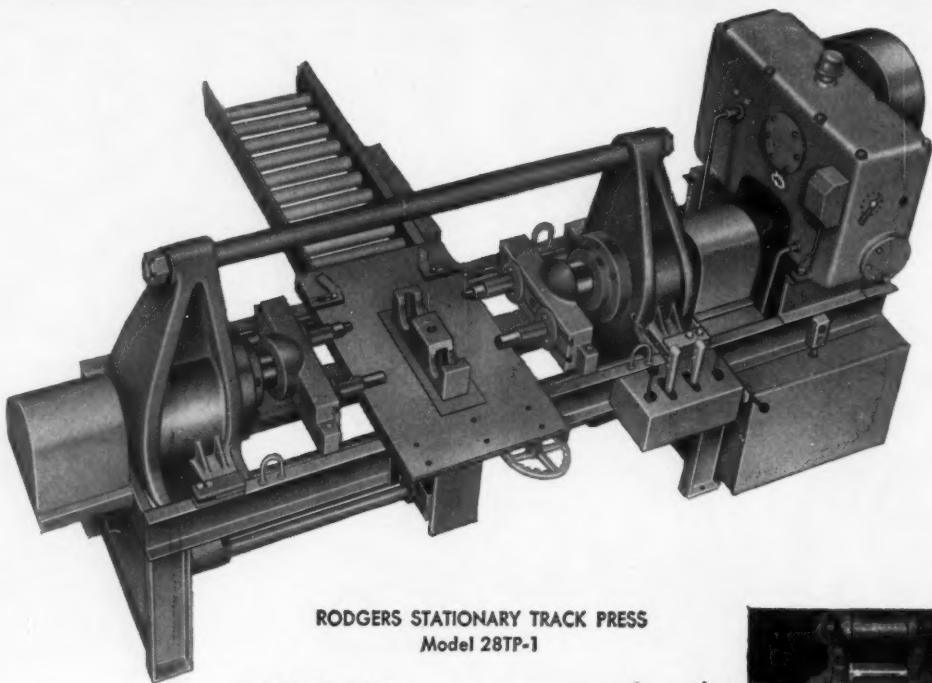
More than 100 different transmission models are available for rubber-tired equipment from 100 to 600 hp, 330 to 1550 cubic inch engines. Check

with your truck manufacturer or write Fuller for the right transmission for your job.



FULLER MANUFACTURING CO., Transmission Division • Kalamazoo, Mich.  
Unit Drag Forge Bldg., Milwaukee 1, Wis. • Shaler Auto Co., Louisville,  
Ky. (Subsidiary) • Sales & Service, All Products, West, Dist. Branch,  
Oakland 8, Cal. and Southwest, Dist. Office, Tulsa 3, Okla.

# Introducing the New 1958 RODGERS TRACK PRESS



RODGERS STATIONARY TRACK PRESS  
Model 28TP-1

Patents Applied for

## The Safest and Fastest operating press ever... To service all makes of crawler tracks

Disassemble a pair of links with grouser (2 bolts removed) in a matter of seconds—in one continuous operation.

Less handling of track components. No broaching of track links. Assemble a pair of links with grouser (2 bolts removed) precisely spaced in one operation in a matter of seconds.

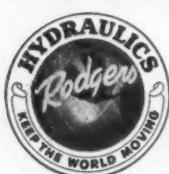
Precise spacing of links thru positive stops on rams—quickly adjustable.

Single pin and bushing can be removed at any point in the track without dismantling track to that point.

### IMPORTANT FEATURES

- Press capacity 150 tons. Press operation completely power controlled.
- Retractable jaws for faster positioning of the track for pressing operation.
- Power winch (5,000 lb. pull). Power drive for movement of track in either direction.
- Your choice of Stationary Models or Trailer Models equipped with air or water cooled gasoline engine.
- Trailer Models equipped with air compressor (.72 CFM at 100 PSI) to operate impact air wrench and other air tools.
- Low cost tooling to service all makes and models of track.

*For complete information  
write for track press catalog 334.*



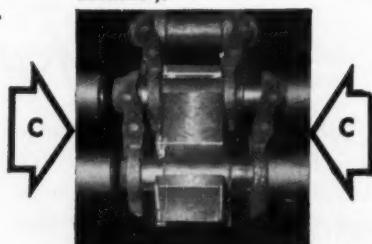
# Rodgers Hydraulic Inc

7403 Walker St. • Minneapolis 26, Minnesota



### Disassembly

- A. Ram at right forces pin and bushing out of link.
- B. Ram at left forces pin and bushing out of link for complete disassembly.



### Assembly

- C. Both left and right rams simultaneously force both links on pin and bushing to complete the assembly in a matter of a few seconds.



# GUARANTEED CAPACITY CROSBY-LAUGHLIN



Size for size, new Crosby-Laughlin\* "Load Rated" Shackles are *50% stronger* than common shackles! And you buy guaranteed capacities ranging from  $\frac{1}{8}$  to 75 tons with the safe working load permanently forged on every shackle.

"Load Rated" Shackles are forged from special alloy steel that has exceptional strength and fatigue resistance. Perfect pin alignment—that distributes stresses equally over the bow—results from drilling pin holes in precision jigs after forming. Heat treated alloy steel pins and bolts in Crosby-Laughlin Shackles are always larger in diameter than the shackle body for additional safety.

Now you can demand—be positive you're getting—genuine Crosby-Laughlin "Load Rated" Fittings because they're painted bright RED. It's the quickly recognized symbol of safety and the world's most complete line of drop forged fittings for wire rope and chain.

\*TRADEMARK



## FREE NEW CATALOG...

lists over 2000 items . . . lets you order Crosby-Laughlin "Load Rated" Fittings the safe way—by capacities . . . includes detailed specifications and dimensional data . . . available now at construction and industrial equipment distributors and mill supply houses—or write direct.



Stocked and Sold by Leading Distributors

**CROSBY-LAUGHLIN** Division

American Hoist and Derrick Company  
FT. WAYNE 1, INDIANA

## SALES AND SERVICE . . .

continued

### In the Main Office

**International Harvester Co.:** Frank W. Jenks, formerly executive vice president, has been elected president of the company. He is replacing Peter V. Moulder, who retired as president after 47 years with the company. W. C. Schumacher has been elected an executive vice president and member of the board of directors.

**American-Marietta Co.:** Stephen W. Benedict has been elected president of the Master Builders Co., and vice chairman of the board of directors of Master Builders Co., Ltd., of Canada. Edwin L. McFalls is retiring as president after 35 years with the company.

### Associations

**Portland Cement Association:** Eugene D. Hill, C. T. Fuller, B. B. Pelly, and L. T. Welshans have been elected as new members of the board of directors. The following three appointments have also been made by the association: J. L. Schneider, secretary; E. P. Sellner, manager of the conservation bureau; and T. E. Long, assistant to the vice president for promotion.

### Special Mention

**Ellicott Machine Corp.:** Two more companies have been acquired by Ellicott as part of its expansion and diversification program. The latest two are the floating dredge business of the Bucyrus-Erie Co., and the floating dredge business of the American Steel Dredge Division of the American Hoist & Derrick Co. Ellicott is prepared to supply repair and replacement parts for all dredges built by both these companies starting immediately.

**Chain Belt Co.:** The company announced the acquisition, subject to government approval on certain tax matters, of the assets of the L. Burmeister Co., manufacturers of concrete batching plants. The personnel of the new division will remain the same.

**Warner & Swasey Co.:** The company has purchased the Badger Machine Co. of Winona, Minn. The name of the Badger line of machines, "Hopto," will be retained.

## Paving problem: *Serious street settlement*

### Solution: A 14-in. Texaco Asphalt overlay



Plankinton Avenue, important Milwaukee business thoroughfare, after completion of new 14-inch plant-mixed Texaco Asphalt pavement.

CONTRACTOR — Schneider-Borchert Construction Company, Milwaukee, Wisc.



MEMBER



The 11-inch Texaco Asphaltic Concrete base was constructed in layers, each with maximum thickness of 3 inches.

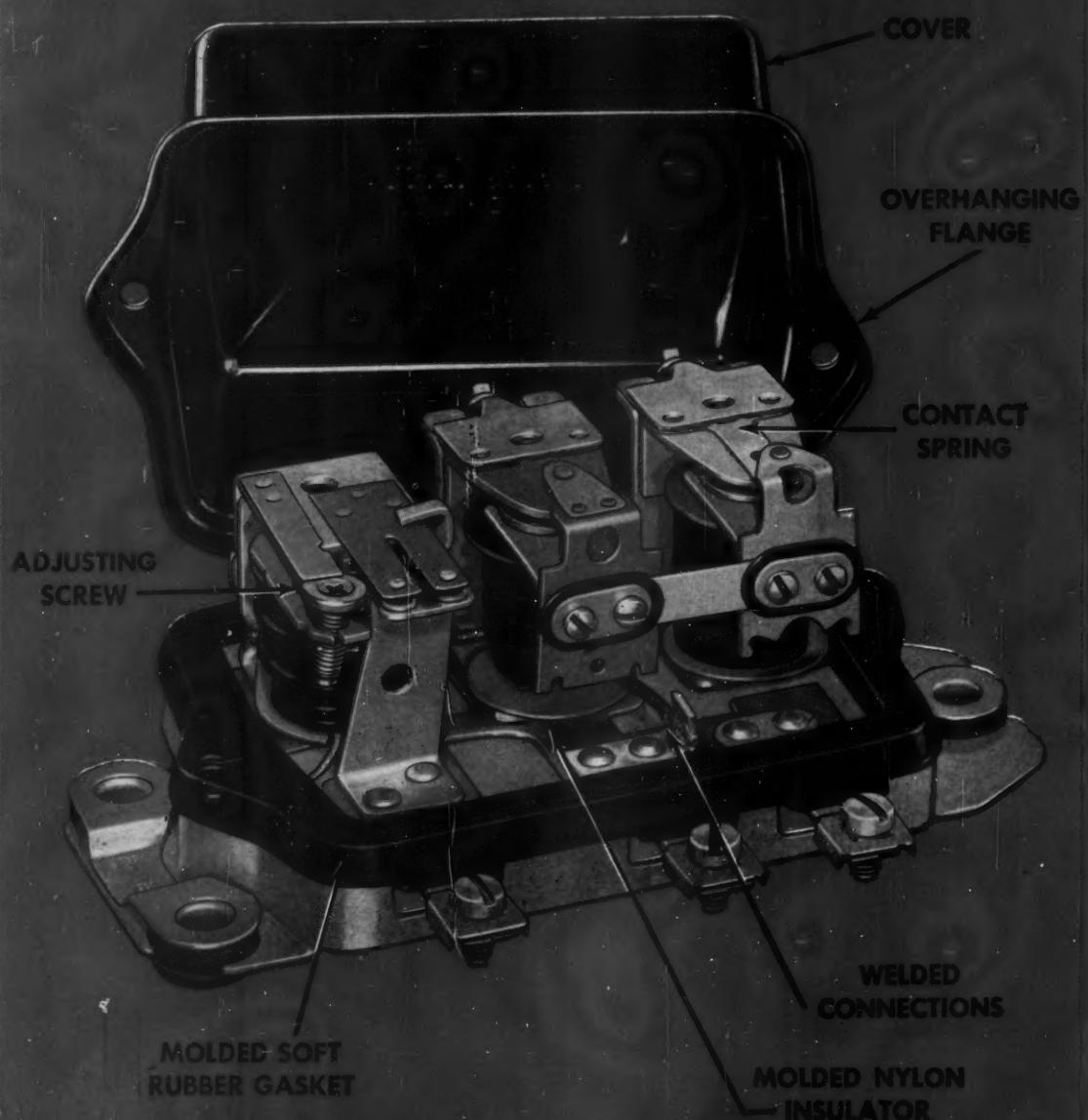
Around raised manholes and other utility outlets, the Texaco Asphalt paving mix had to be hand raked.

THE TEXACO COMPANY, Asphalt Sales Div., 135 E. 42nd Street, New York City 17  
Boston 16 • Chicago 4 • Denver 1 • Houston 1 • Jacksonville 2 • Minneapolis 3 • Philadelphia 2 • Richmond 19



# TEXACO ASPHALT

**PROGRESSIVE ENGINEERING  
MAKES THE DIFFERENCE**



# **DELCO-REMY WATERPROOF STANDARD REGULATORS**

## **IMPROVE FLEET PERFORMANCE**

Better electrical performance and greater dependability in any weather are important benefits to fleet operators found in Delco-Remy's waterproof standard generator regulators, now available for general replacement use.

And here are the features that make them the *right* regulators for Delco-Remy equipped cars and trucks in fleet operations.

- 1 New overhanging one-piece formed-steel cover and mating base shed road splash . . . convenient attaching screws are *outside* the enclosed area. Molded soft rubber gasket seals out harmful oil and water vapors.
- 2 Integral sleeves of molded nylon insulator form permanent seal around rivets—assure watertight base.
- 3 New, longer, more flexible armature contact spring on voltage regulator unit assures more positive closing of contact points for smoother operation.
- 4 Welded electrical connections, and highest quality tungsten and non-tarnishing precious metal contact points, assure minimum resistance, maximum durability.
- 5 Special fine thread screw-type controls allow easy, highly accurate adjustment of all three units.

Always replace with Delco-Remy waterproof regulators when you service Delco-Remy equipped cars and trucks. These improved regulators, built to highest quality standards by the original equipment manufacturer, are available from your car or truck dealer or the United Motors System.

**DELCO-REMY • DIVISION OF GENERAL MOTORS • ANDERSON, INDIANA**



GENERAL MOTORS LEADS THE WAY—STARTING WITH

# **Delco-Remy**

ELECTRICAL SYSTEMS

# Construction Equipment News...

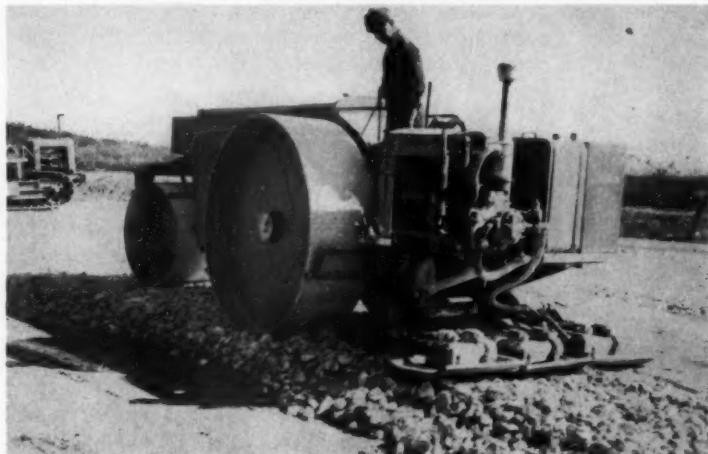
## Galion Adds 160-hp Grader to Its Line

The latest addition to the extensive Galion motor grader line is a 30,000-lb model powered by a six-cylinder, 160-hp Cummins diesel. Called the model 160, it features a box-type, single-member frame that weighs 134 lb per ft. A six-speed, constant-mesh transmission has a range of 1.3 to 22.6 mph. Standard features include a 13-ft. x 29-in. hydraulically shifted moldboard, combination hand and hydraulic booster steering system, and 14.00-24, 10-ply tires.—Galion Iron Works & Mfg. Co., Galion, O.



## Two-in-One Roller Speeds Compaction

Austin-Western's roller-compactor cuts compaction costs because the one machine performs surface rolling and deep-penetration compaction at the same time. The machine is a standard 10-12-ton three-wheel roller with three vibrating shoes mounted at the rear, together with an independent 61-hp engine and hydraulic system. Each 450-lb shoe delivers 2,200 vibrations per min through  $\frac{1}{4}$ -in. vertically. When not in use, the vibratory unit raises off the ground.—Austin - Western, 600 Farnsworth Ave., Aurora, Ill.



## New Tractor Loader Introduced by Case

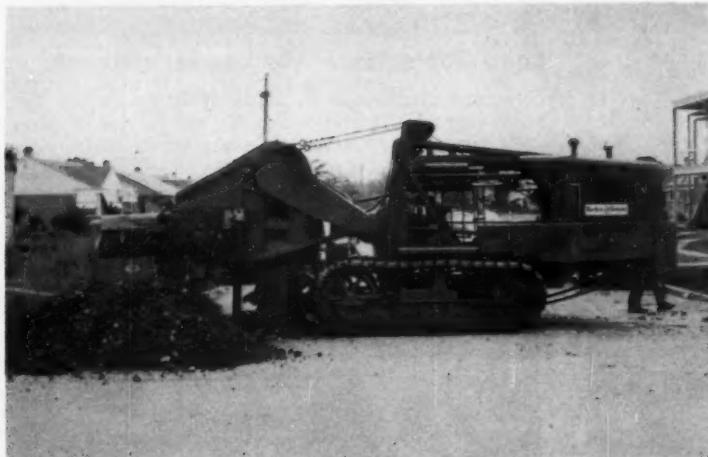
A four-wheel-drive, rear-wheel-steer industrial tractor-loader in the  $1\frac{3}{4}$ -yd class is the first of a new line to be introduced by J. I. Case. Called the W-9, it features short, rigid lift arms that pivot forward of the operator's position and provide exceptional stability, visibility, and forward reach. The W-9 has a breakout force of 11,000 lb and a lift capacity of 5,500 lb in the carry position. A 251-cu-in. Case engine with power drive produces speeds ranging from 0 to 21 mph.—J. I. Case Co., Racine, Wis.





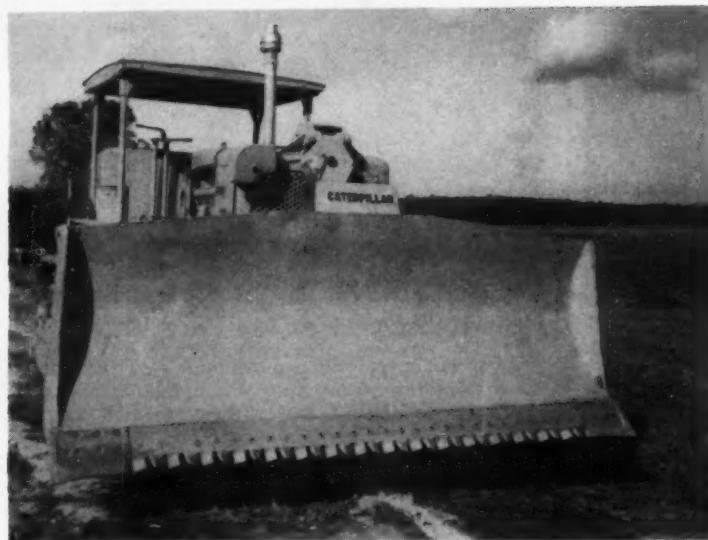
### All-Aluminum Body Increases Payloads

The rugged Heil rock body pictured on the left is fabricated from aluminum alloy and extruded sections of aluminum instead of from steel plate. Although the original cost of these aluminum bodies is much higher than steel-plate bodies of comparable size, the 36-yd aluminum body, because of its lighter weight, offers greatly increased payload capacity and travel speeds and reduced tire wear and fuel consumption. The first units will haul bauxite in the Caribbean.—Heil Co., Milwaukee 1, Wis.



### Ditcher on Tracks Has Vertical Boom

A vertical boom that mounts on the chassis also used for the Barber Greene model 774 wheel-type dumper provides a maximum digging depth of 7 ft and bucket widths of 19, 21, and 24 in. The new model 784 crawler-mounted dumper uses Barber-Greene's Hydra-Crowd transmission, which offers variable range of forward crowding speeds from 0 to 31 ft per min. These are independent of bucket line speeds. The vertical boom can be replaced with the 774's 5½ ft. digging wheel.—Barber-Greene Co., Aurora, Ill.



### Teeth on Blade Edge Break Up Materials

A series of new cutting edges for scrapers, dozers, loaders, and motor graders features chisel-shaped teeth that crumble tough materials better than a straight blade and leave them in better condition for loading, dumping, or compaction. Called 'Gator Twis-tooth' blades, they also cut down on the amount of impact transmitted to equipment and increase the digging action of the blade. Ideally suited for scrapers, they reduce voids caused by unbroken material entering the bowl.—Shunk Mfg. Co., Bucyrus, O.

*Continued on next page*



#### Tow-Type Roller Features Vibrator

Bros tow-type Vibra-Pactor roller weighs only 4½ tons, but exerts a variable force equal to a 7½-ton roller. Drum dia is 48 in. and rolling width is 66 in. A 40-hp engine powers the vibrator, which produces up to 1,300 vibrations per min. A feature of the roller is its ¼-in. amplitude—the distance the drum raises from the ground with each revolution.

—Bros Inc., 1057 10th Ave. S. E., Minneapolis, Minn.



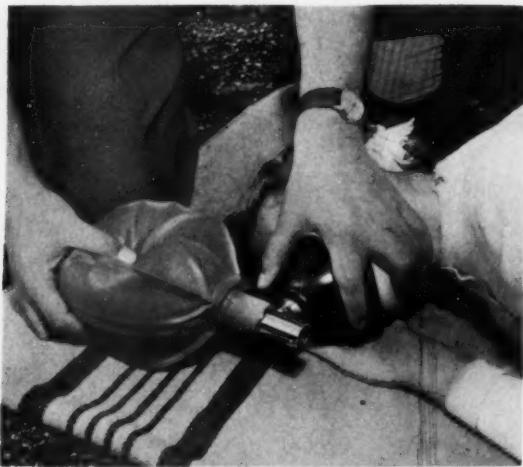
#### Long Boom Increases Loader's Reach

Dumping clearances up to 13 ft 10 in. under the hinge pin and 11 ft 4 in. under the bucket cutting edge are now available with the 2-yd TL-20D Tracto-loader, thanks to a long-boom attachment. The loader now reaches out 3½ ft at maximum height. Materials weighing up to 2,700 lb per yd can be handled by the TL-20D when it is equipped with the long boom.—Tractomotive Corp., Deerfield, Ill.



#### Chain Saw Replaces Rotary Blade

A chain saw attachment for Black & Decker models 73 and 83 electric saws easily replaces the rotary blade to cut timber or structural lumber. The chain saw attachment is also excellent for cutting in hard-to-reach places where rotary saws are at a disadvantage. A wide aluminum safety shield protects hands and other parts of the body.—Black & Decker Mfg. Co., Towson 4, Md.



#### How to Save Lives the Easy Way

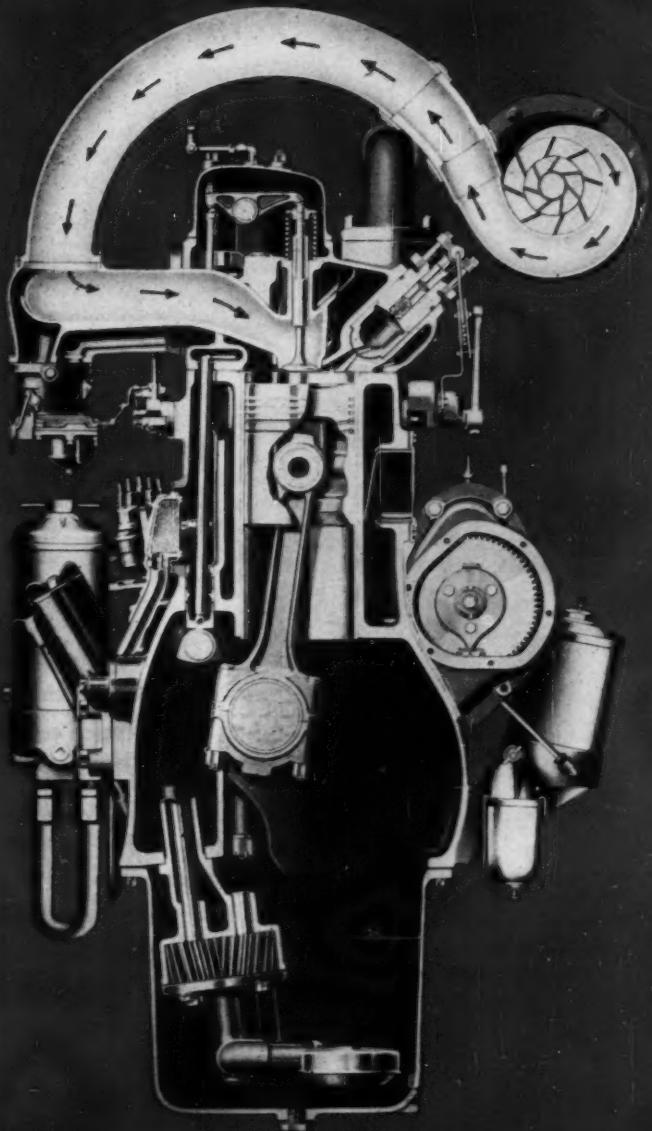
Anyone can operate Schuco-Ambu life-saving equipment anywhere. Consisting of a manually operated resuscitator (above) and a foot-operated suction pump, the equipment does not need oxygen, electricity, or a trained operator. The resuscitator can be operated for hours without effort.—Schueler & Co., 75 Cliff St., New York 38, N.Y.

continued on page 151

Sectional view of new UDT-1091  
Turbotorque diesel engine. Engine  
bhp (less load) 300 max. output: 265  
intermittent; 215 continuous @  
1,500 rpm.

# LET'S FACE IT!

New International UDT-1091  
Turbotorque® diesel costs  
less on any application  
needing dependable 265 bhp.



When you spend big money for big power, get big production returns with the dependable diesel engine that costs less to operate—the new International UDT-1091 Turbotorque.

You can depend upon the efficient UDT-1091 to cut consumption of low-cost No. 2 diesel fuel while maintaining 265 intermittent load hp at any altitude up to 10,000 feet.

As in all seven famous International diesels, you can depend also upon the UDT-1091 giving

you: 1) a full measure of lower cost power; 2) super-sealing against life-robbing abrasives; 3) easier, faster starts in any weather; and 4) simple, rugged 4-cycle design.

Get the full facts and figures on why Internationals are the most economical diesels you can own. See your nearby International Power Unit Distributor or Dealer soon. He's a man you can count on for dependable power recommendations and the finest engine service in the industry.

**INTERNATIONAL®**

International Harvester Company  
180 N. Michigan Ave., Chicago 1, Illinois



**CONSTRUCTION EQUIPMENT**

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

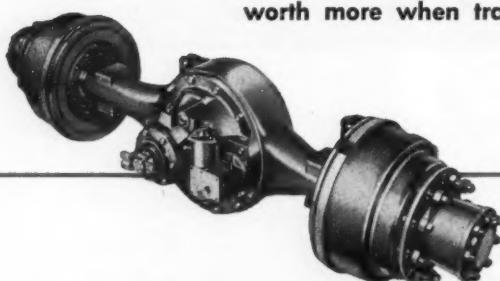
*In the  
Heavy  
Construction  
Industry—*



## Eaton 2-Speed Axles Keep Trucks on the Job —Cut Operating and Maintenance Costs

More than Two Million  
Eaton Axles in Trucks Today.  
For complete information,  
see your truck dealer.

Pulling out-of-the-hole in off-the-highway operation, making time on the hills, maneuvering in heavy traffic, highballing on the open road — each calls for a different gear ratio to assure maximum efficiency, economy, and safety. Eaton 2-Speed Axles double the number of available gear ratios, permitting the driver to use the one best suited to road, load, and traffic conditions. This use of the right gear ratio for every situation permits engines to run in their most efficient and economical speed range, reducing stress and wear on all power-transmitting parts. Not only do Eaton 2-Speed Axle trucks make more and quicker full-load trips, but they do it at lower operating cost and with less maintenance; they stay on the job and out of the shop. Even under the roughest conditions, trucks equipped with Eaton 2-Speeds last thousands of miles longer — and they're worth more when traded in.

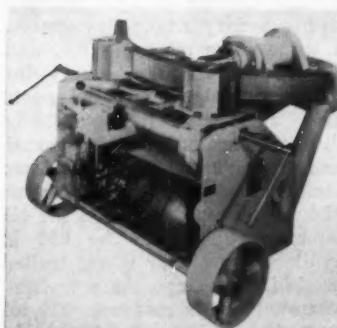


# EATON

AXLE DIVISION  
MANUFACTURING COMPANY  
CLEVELAND, OHIO



**PRODUCTS:** Engine Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Hydraulic Pumps  
Motor Truck Axles • Permanent Mold Gray Iron Castings • Forgings • Heater-Defroster Units • Automotive Air Conditioners  
Fastening Devices • Cold Drawn Steel • Stampings • Gears • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers



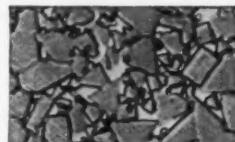
**PORABLE BENDER**—The Wallace bending machine uses hydraulic ram action to bend  $\frac{3}{4}$  through 6-in. pipe, I-beams, channels, angles, or similar structural shapes. Pipe or other shapes to be bent are placed in support blocks which are dies shaped to fit the part, and the hydraulically operated ram moves forward against the piece, causing it to bend to the desired radii. A single hydraulic valve brings the ram cylinder in and out of bending position. The bending machine, which is wheel-mounted to increase portability, needs only  $7\frac{3}{4} \times 7\frac{1}{2}$ -ft of floor space. With standard dies, it weighs 9,700 lb.

—Wallace Supplies Mfg. Co., 1304 Diversey Parkway, Chicago 14, Ill.

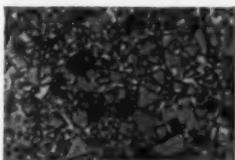


**SINGLE ROTOR**—Davey's new Hydrovane rotary 600-cfm compressor is said to be the only multi-stage rotary unit with a single, free-floating rotor. This is located so that it is constantly concentric with only one side of the stator. Blades are of the segmented type, inserted radially in longitudinal slots. They move continuously in a straight line from the stator center and cannot cock or bind, according to the manufacturer. When the rotor turns and compression occurs, the cooling oil is fed in by two injection chambers. This is said to produce continuous cooling action that greatly lowers the air discharge temperatures. Other features of the 600-cfm compressor

## Longer bit life—with new Sandvik Coromant Bits



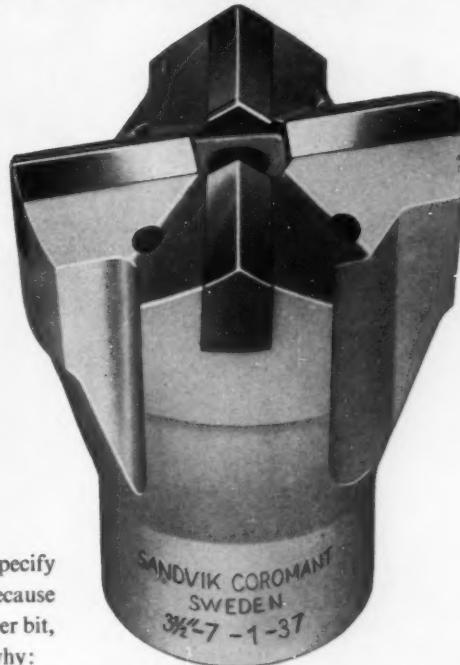
**Sandvik Coromant Tungsten Carbide.** (Microphoto) Uniformity of size, even distribution of grain are marked. Free from porosity and impurities—therefore stronger, longer-lived.



**Low quality Tungsten Carbide.** (Microphoto) Black marks are contaminations caused by deficient production control. They weaken the carbide, reduce its working life.

NEXT time you buy bits, specify Sandvik Coromant because they give you more footage per bit, lower drilling costs. Here's why:

- 1 Only first-quality tungsten carbide is used—as shown in the microphotos above. This means less wear, longer life and a better job.
- 2 The bodies are precision-made of high quality alloy steel—tough enough to take the strain throughout the extra-long bit life.
- 3 The bigger Sandvik Coromant bits are all of X-design, which prevents rifling. No wonder Sandvik Coromant inserts are the most widely used in the world, drilling more than one billion feet every year.



THESE STANDARD SIZES ARE AVAILABLE										
		DIAMETERS AVAILABLE (IN INCHES)								
THREAD	SHOULDER TYPE	$\frac{7}{8}$ " F	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
		$\frac{1}{2}$ " H	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
BOTTOMING TYPE	SHOULDER TYPE	$1\frac{3}{8}$ " D			2	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{3}{8}$	$2\frac{1}{2}$	$2\frac{5}{8}$
		$1\frac{1}{8}$ " K								3
THREAD	SHOULDER TYPE	$1\frac{1}{4}$ " Rope		$1\frac{7}{8}$	2		$2\frac{1}{4}$		$2\frac{1}{2}$	
		$1\frac{1}{2}$ " Rope							$2\frac{1}{2}$	$2\frac{5}{8}$
THREAD	SHOULDER TYPE	2"	Rope						3	3 $\frac{1}{2}$
		400			2		$2\frac{1}{4}$	$2\frac{1}{2}$		4
THREAD	SHOULDER TYPE	600							$2\frac{1}{2}$	$2\frac{5}{8}$
									3	3 $\frac{1}{2}$

Shaded area indicates X-Bits

SANDVIK COROMANT bits are supplied through Atlas Copco, the world's largest manufacturer of rock drills, who also supply Sandvik Coromant integral steels—the most widely used in the world—and Sandvik Coromant extension steel equipment.

Write, phone or cable today for further details to any of the addresses below:

**Atlas Copco**

ATLAS COPCO EASTERN

ATLAS COPCO PACIFIC

ATLAS COPCO CANADA

ATLAS COPCO MEXICANA

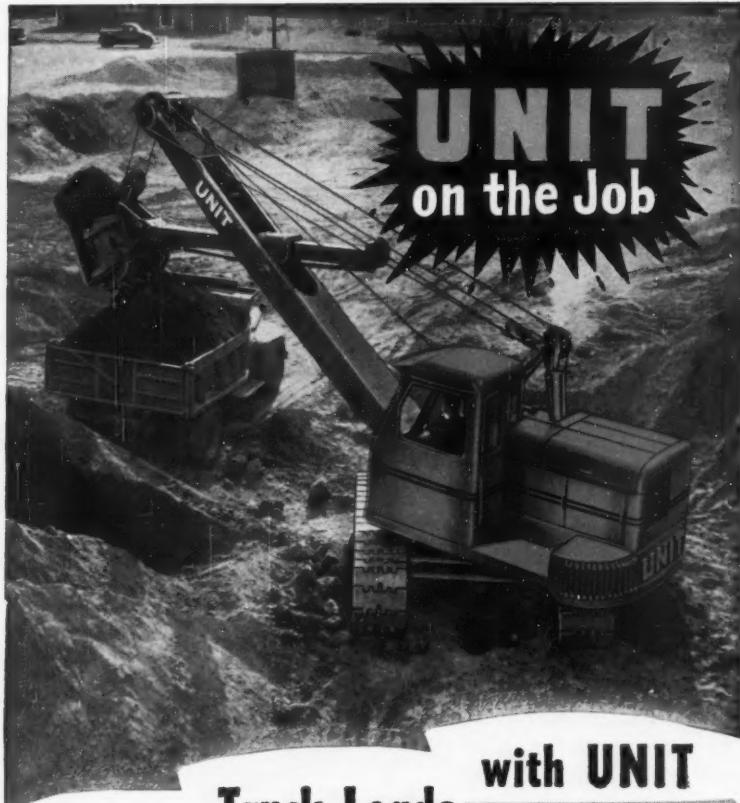
P.O. Box 2568, Paterson 25, N.J. Phone Armory 4-3310

930 Brittan Ave., San Carlos, Calif. Phone Lytell 1-0375

Montreal Airport, Quebec. Phone Melrose 1-5571

Apartado Postal 56, Torreón, Coahuila. Phone 39-07 0077

## EQUIPMENT NEWS . . . continued



### with UNIT Truck Loads Step-up

Here's a UNIT  $\frac{3}{4}$  yard Shovel that's "in there swinging" . . . making big payloads. UNIT'S balanced stability and power permit hard digging . . . produce maximum yardage at low operating cost. Fewer working parts cut down replacements required . . . reduce maintenance costs. The FULL VISION CAB enables operator to see in ALL directions . . . promotes safety . . . increases efficiency. Results in more loads per day and easier load handling. Get the complete UNIT story. Write for literature.

**UNIT CRANE & SHOVEL CORPORATION**  
6305 WEST BURNHAM STREET • MILWAUKEE 14, WISCONSIN, U.S.A.



**$\frac{1}{2}$  or  $\frac{3}{4}$  YARD EXCAVATORS...CRANES UP TO 20 TONS CAPACITY  
CRAWLER OR MOBILE MODELS . . . GASOLINE OR DIESEL**



**All Models Convertible to ALL Attachments!**

include the use of both primary and secondary intake air cleaners, a three-stage oil separator, and a vacuum-hydraulic, supply-demand control system. All parts are available for servicing through a removable end panel and side panels. Sight windows are provided for visual inspection of lube oil conditions and the oil separation process. The 600 is available with four-wheel trailer or skid mountings. As a trailer-mounted unit it measures 130 in. long, 79 in. wide, and 74 in. high. It weighs 8,196 lb.—Davey Compressor Co., Kent, O.



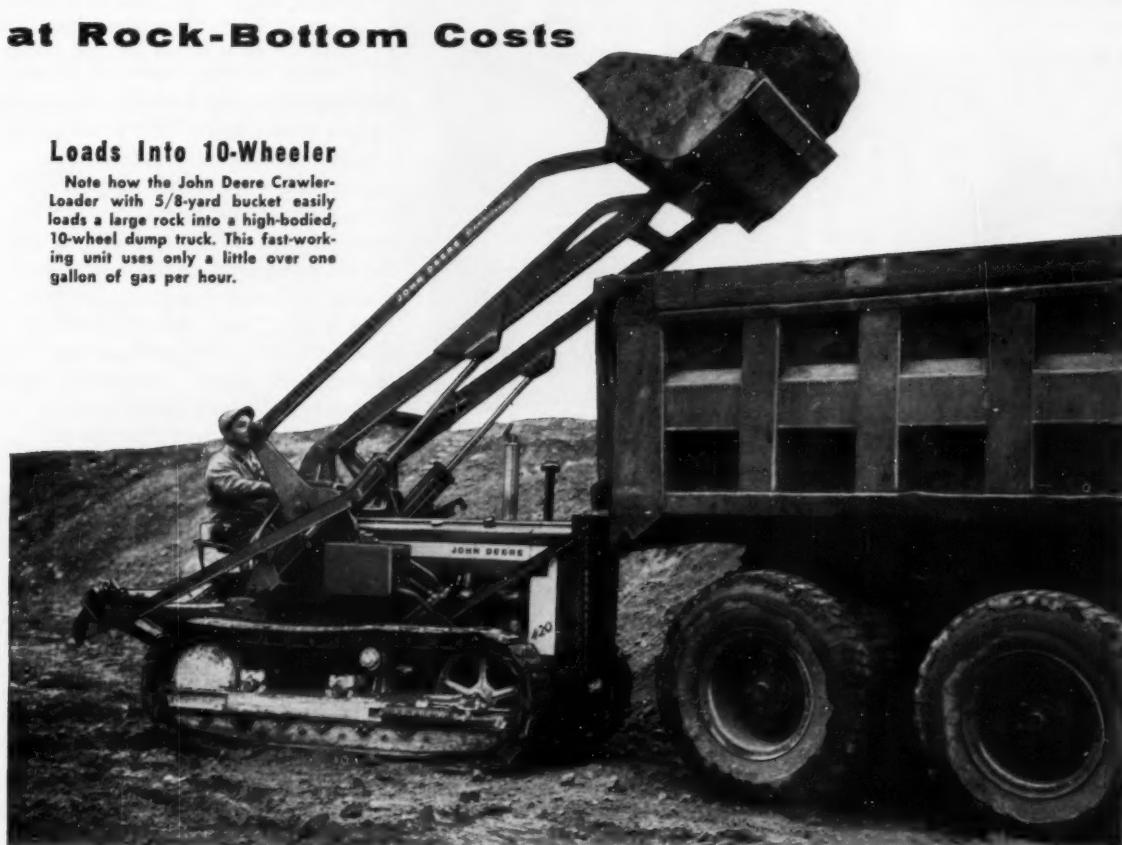
**37-LB DRILL**—An easy-to-handle diamond core drill that weighs only 37 lb, yet reaches depths of 200 ft with a  $\frac{3}{4}$ -in. bit, has been developed by the Wink Corp. The drill can also handle larger core diameters—up to 6 in.—at lesser depths. According to the manufacturer, the drill uses only about 2 gph of fuel per shift, and needs as little as  $1\frac{1}{2}$  gal of water per ft of hole. An overhead drive principle permits 10-ft strokes without rechucking the drill rod, and penetration speeds in excess of 1 ft per min at 100-ft depths have been reached in tests. Wink has tested the drill on such projects as rock and concrete coring, blast hole drilling, and soils sounding. Engineering features include a water-cooled gear box, safety clutch, built-in water swivel, and a convenient bullseye level. A 5  $\frac{1}{2}$ -hp, 2-cycle gasoline engine with a vacuum carburetion system allows continued drilling at all angles. An aluminum-magnesium alloy is used wherever possible in both the drill and the engine to keep weight at a minimum. The Winkie drill requires no structural support for most jobs, according to manufacturer, but when coring at considerable

# JOHN DEERE CRAWLER-LOADER for Peak Performance

at Rock-Bottom Costs

## Loads Into 10-Wheeler

Note how the John Deere Crawler-Loader with 5/8-yard bucket easily loads a large rock into a high-bodied, 10-wheel dump truck. This fast-working unit uses only a little over one gallon of gas per hour.



MATCH the work output of larger tractors on many jobs . . . hold down your costs all the way . . . with the John Deere "420" Crawler-Loader—a versatile, high-quality unit that you'll find mighty profitable to own.

Amazing power for its size . . . compact design . . . clutch-brake steering . . . and the fast, handy direction reverser are some of the many features that put the John Deere in a class by itself for speedy, low-cost maneuverability and daily work output.

Seeing is believing! Get in touch with your nearest John Deere Industrial Dealer.

For More Facts See Your Nearest John Deere Industrial Dealer



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# MALSBARY MAINTENANCE CLINIC

## Mobile Steam Cleaners Pay Off



"All Equipment gets more frequent attention; no trucks or graders need be out of action long for cleaning; and the cleaner adds punch to our toughest assignment, keeping highways open and safe during winter storms," reports Brown County, Wisc., of this trailer-mounted Malsbary 250 HPC (high pressure combination) cleaner. In winter, it removes snow and ice from snow plows, trucks, highway patrol squad cars, and thaws out frozen culverts to prevent road flooding. During summer, it speeds maintenance by going to roadbuilding jobs and cleaning blacktop equipment "every chance we get."

Asphalt and Dirt stuck so stubbornly that servicing—even greasing—first required its removal from the roadbuilding equipment of The White Construction Co., Milwaukee, Wis. This literally had to be done with a shovel. Now a Malsbary 250 HPC cleaner, mounted on same truck as lube equipment, takes steam cleaning right to the job, "does in minutes what used to take hours." Says Foreman Ellerman, "Malsbary cleaning certainly speeds greasing and other maintenance."



Tricycle-Mounted Malsbary 250 HPC is easily pulled around large equipment yards and shops, or over uneven ground on field jobs. It speeds service work by taking steam cleaning to the job—no carting big assemblies to the cleaner or trying to squeeze heavy rigs into small cleaning sheds. Brackets for holding coiled hose and steam gun eliminate dragging, enable you to take full advantage of tricycle portability.

Whether you use portable or stationary Malsbary High Pressure Combination cleaners, you're sure of fast cleaning—4 to 10 times faster than most other cleaners, and at  $\frac{1}{2}$  to  $\frac{1}{5}$ th the cost. For proof call your Malsbary dealer (see yellow pages of phone book) and ask for a demonstration... or write us for literature showing how Malsbary steam cleaning pays off for other successful earth-movers and dealers.

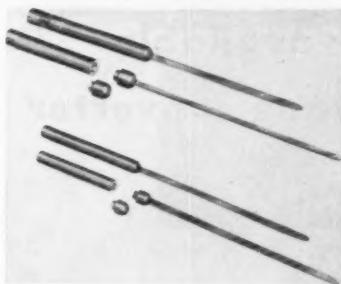


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in U. S. and Canada.

## EQUIPMENT NEWS . . . continued

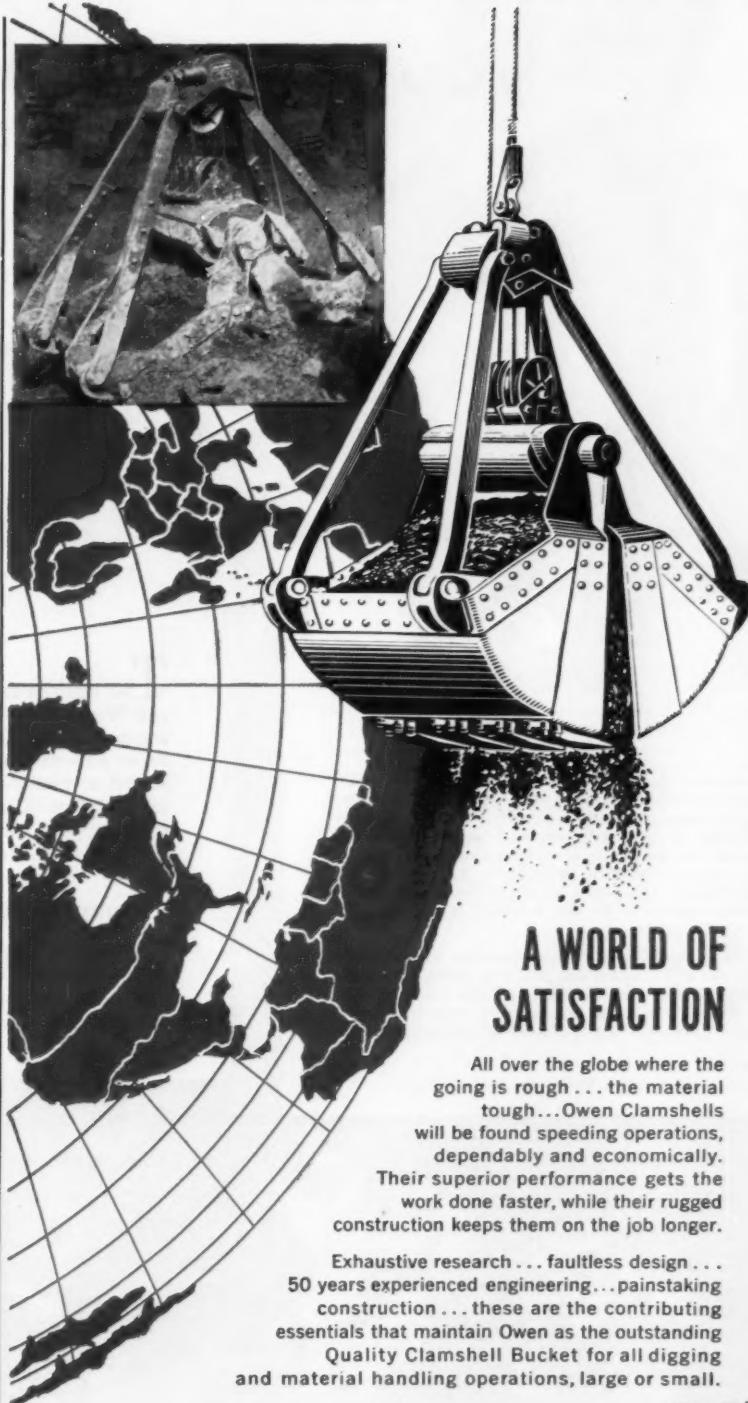
depths a tripod that facilitates the removal of drill rods is available as optional equipment. When drilling in extra hard formations a mechanical-advantage device called the Persuader is also available to provide increased down pressure.—Wink Corp., 1518 N. 117th St., Milwaukee 13, Wis.



**FOR PRESTRESSING** — New blades that vibrate concrete in extremely confined areas—such as prestressed concrete forms—have been developed by Dart Mfg. Co. Called Sabre blades, they are available in a 22 in. size that is only 1 1/4 in. wide and 3/16 in. thick; and in a 20-in. size that is 1 1/2 in. wide and 1/8 in. thick. They attach easily to Dart vibrators. Operating at up to 14,000 rpm at 60 cycle, the slender blades can work in restricted areas where normal units cannot reach. The lightweight blades (17 lb each) are built from high grade spring steel. The sabre blade action is said to eliminate bubbles forming along the blade sides and to give a better concrete bond to cables.—Dart Mfg. Co., Denver, Colo.



**SHOP PRESS**—A full size drill press might be too expensive an investment for most contractors' shops, but the new Portomac Mighty-Midget can fill the bill economically. Because of its compact size (only 9 1/2 in. high) and its exceptional lightness (just 20 lb), the unit performs jobs in



### A WORLD OF SATISFACTION

All over the globe where the going is rough . . . the material tough...Owen Clamshells will be found speeding operations, dependably and economically.

Their superior performance gets the work done faster, while their rugged construction keeps them on the job longer.

Exhaustive research . . . faultless design . . . 50 years experienced engineering . . . painstaking construction . . . these are the contributing essentials that maintain Owen as the outstanding Quality Clamshell Bucket for all digging and material handling operations, large or small.

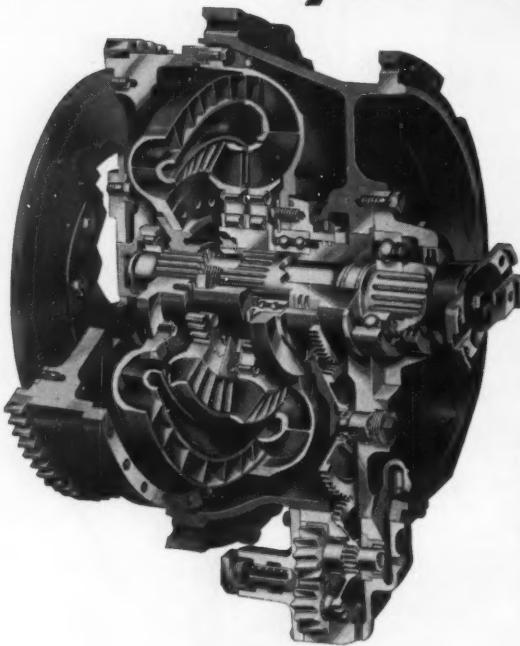
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# NOW...choose the transmission you want on the "Big B"



Single stage, 4-element torque converter multiplies engine torque hydraulically, to match load demand . . . acts as fluid coupling when torque multiplication isn't needed. Above 1850 rpm, converter automatically locks out . . . eliminates converter slip for maximum economy at haul speeds . . . resumes normal operation when heavy pulling slows rpm below 1850. Constant-mesh planetary gear system provides 4 forward speeds to 30 mph, 2 reverse to 5.8 mph.

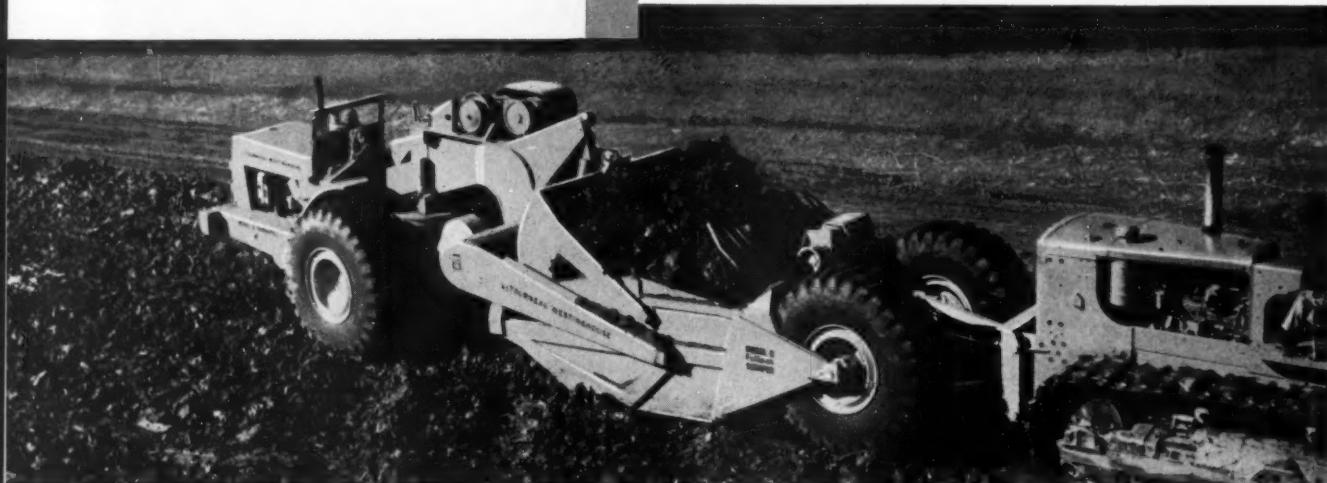
Low, wide Fulppak lets dirt flow back into bowl almost on the level. B 'Pull needs less power for lifting dirt: applies more to cutting. Curved tailgate top rolls dirt forward into all corners. "Big-belly" apron packs extra dirt low for big-pay production and low center of gravity.

## Fastest-loading BIG scraper now available with torque converter

The world's top-production earthmover, the LeTourneau-Westinghouse B Tournapull® with 27-yd. Fulppak® scraper, is now available with your choice of transmissions. Effective immediately, you can choose the unit best suited to your production demands, fleet set-up, or service facilities. Choose between, a) new power-shift transmission, with production-boosting torque converter, or, b) hand-shift, step-gear transmission.

### Complete power-package . . . with 335 hp

New on the "Big B" is the well-known, world-tested Allison Torqmatic Drive . . . a complete power-transmitting "package" that includes torque converter, hydraulic retarder, range gearing, transfer gears, and accessory com-



Torque converters boost production, cut maintenance, of these other L-W units, too!



210 hp, 17 mph  
rubber-tired Tournatractor®. (Also  
420 hp Twin-C™  
push-tractor, log-  
ging arch, Switch-  
Tractor™, and  
SwitchMobile®.)



210 hp, 26.1  
mph C Tournapull  
with 18-yd.  
Fulppak scraper.



Adams\* 190 hp POWER-Flow\* 660 motor grader.



ponents. And, powering the new torque-converter "B", is a giant 335 horsepower Cummins engine.

For contractors who prefer its lower initial cost, the step-gear type Fuller transmission — with 10 forward speeds, and two reverse — is still available. With this transmission, you have your choice of a 300 hp Cummins engine or a 300 hp GM unit.

#### Fullpaks load fuller, faster

Standard, of course, on all "B's" — whether you choose Torqmatic or step-gear transmissions — is the money-making Fullpak scraper. Because Fullpak is lower, wider, dirt flow is nearly horizontal. Result — "Pull" needs less force for lifting, can apply more to cutting and pulling. Curved-top tailgate rolls dirt into corners and apron, for better "boiling". Fast-acting electric controls regulate bowl hoist, apron lift, tailgate movement, and steer, for still more speed. That's why Fullpaks get bigger, lower-void payloads faster... haul and maneuver faster... with lower center of gravity for greater stability... move dirt at lowest-net-cost-per-yard!

#### See a Fullpak in action

Compare the production you are now getting with that of this 27-*yd.* heaped-capacity Fullpak scraper. When you watch your old scrapers work, remember the faster loading... and the extra yards per load... of this BIG Fullpak. Consider "Big B's" torque-converter transmission... automatically balancing power and speed... always geared to use higher speeds when practical. See the new "B's" in action. Figure your next job with them in mind. Ask us to give you full data.

#### Maximum power use... faster cycles

Main advantage of the new 4-speed, torque-converter transmission available on the B Tournapull is higher production-power. Uphill or down, blade in the ground or out, the converter automatically adjusts power output to keep your "Pull" working at the fastest speed possible for load and terrain. Because speed and torque are instantly adjusted to the load, the engine produces maximum output at all times. And the flow of power is never interrupted, even during the quick, easy, and smooth shifts possible with this transmission. Net result to you is that all of your engine's "horses" are put to work, speeding your cycles for greater net profit.

Operators work more efficiently, too. There's no clutch-pedal... no double-clutching or lever-wrestling to worry about... no "penalty" for guessing wrong about which gear range to use. Your men can concentrate on getting a bigger load, hauling more safely, spreading more accurately.

#### Helps lower maintenance costs

Maintenance costs will be lower, too, with your new torque-converter B "Pulls". The new power system acts as a cushion... protects drive and engine from harmful shock loads... ends the damaging shock of clashing gears... reduces over-all engine wear by assuring constant, even power. Tires last longer, as well, because the smoother starts and acceleration of a torque-converter machine cut down tire spin. And you have no clutch mechanism to service.

#### Protects your investment...

B Tournapull's new power system improves safety. The faster, easier shift gives your operator sure, safe control of his machine at all times. Even reverse shift is instantaneous. You'll never stall your engine at a crucial moment. For work on grades, the hydraulic retarder assures safer downhill hauling... using the fluid drive oil to dissipate energy and thus slow the engine. This auxiliary braking system makes regular service brakes last much longer.

\*Trademark BP-1622-DC-2

**LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS**

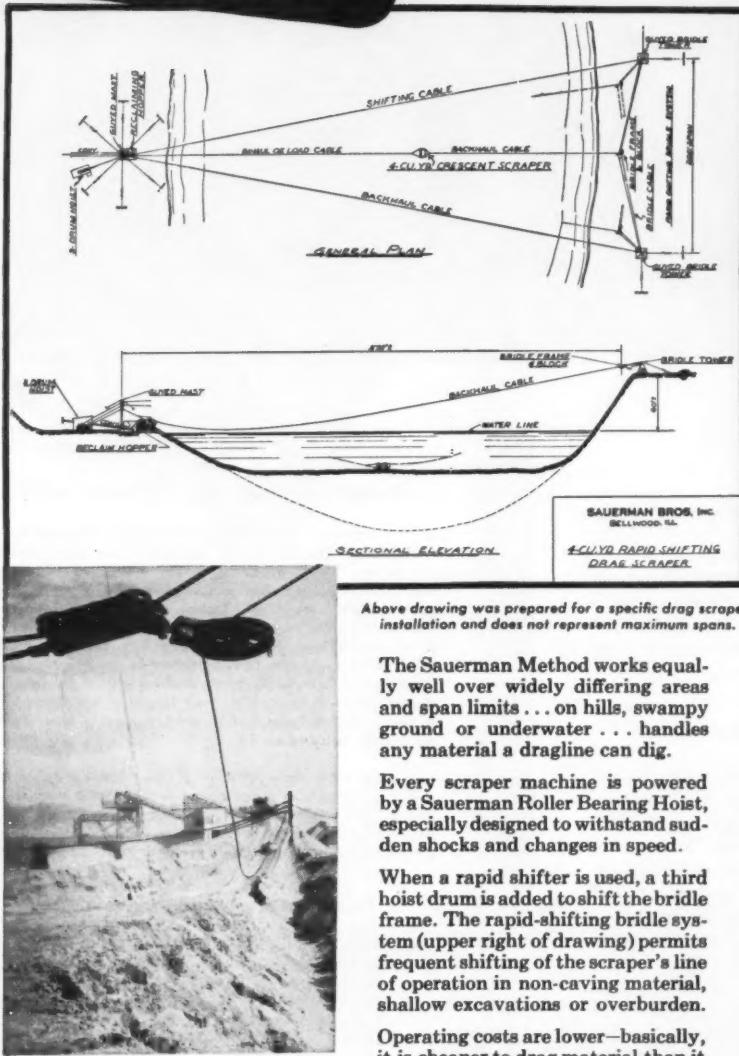
A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit



# **the SAUERMAN METHOD.....**

## **Scraper Machines Engineered to Your Operation**



**View shows rapid shifting bridle frame and all operating cables. Crescent may be seen in background conveying load to reclaiming hopper just in front of mast.**

**Contact Sauerman's engineering department for specific recommendations and information. No obligation.**

**Ask for Catalog A, Drag Scrapers—  
24 pages of job photos and specifications. Request Field Reports showing your material being handled by the low cost Sauerman Method.**

Sauerman can help you select the method of materials handling most profitable for your job—a system that will give you the lowest cost per cu. yd. handled.

# **SAUERMAN**

**612 S. 28th AVE.**

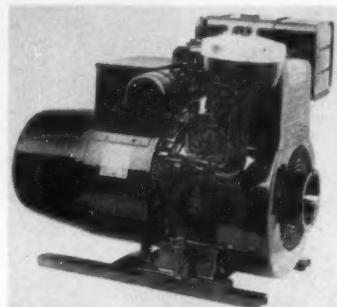
**BROS. INC.**

## BELLWOOD, ILL.

**Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks**

**EQUIPMENT NEWS . . . continued**

close quarters and hard-to-reach locations that are inaccessible to larger presses. Particularly adaptable for tool set-up work, dies, jigs, and maintenance and repair jobs, it will drill up to  $\frac{3}{8}$ -in. holes and tap  $\frac{5}{16}$ -in. holes with accuracy and safety.—**Portomag, Inc., 1511 E. Nine Mile Rd., Ferndale 20, Mich.**



**OFFERS A CHOICE**—Gen-A-Matic's new 40-A electric plant provides 120 v., 240 v., or a combination of both. The model 40-A is a 4,000-w generator powered by a four-cycle engine with automatic spark advance to insure fast starting. The complete unit weighs just 230 lb. Twelve volt windings are included as standard equipment on the new plant, which is designed for portable or stand-by service.—**Gen-A-Matic Corp.**, 14741 Bessemer St., Van Nuys, Calif.



**ALUMINUM PUMPS** — New lightweight, self-priming centrifugal pumps in 1½ and 2-in. discharge sizes are the first models in a new line of aluminum pumps to be introduced by Marlow. The 1½-in. unit weighs only 49¾ lb and the 2-in. unit tips the scales at 52½ lb. Both are powered by Briggs and Stratton

# Are you losing dirtmoving profits

through a **HOLE** in your pocket?

**O**n every sizeable grading contract there are scattered small-yardage, odd-lot jobs... jobs that bleed away good profits made by your big-yardage machines on heavy production sections. These scattered small-yardage assignments — such as improving haul roads, opening drainage ditches, building shoulders, backfilling, leveling sub-grades, hauling and spreading topsoil — can easily delay your work completion, postpone final payments... reduce your profits.

You can plug this "hole in your pocket" with a high-speed, 1-man, 29.5 mph LeTourneau-Westinghouse D Tournapull® with 9-yd. scraper. This "Handyman D" travels anywhere — via highways, over curbs or tracks, across fields — often gets to a job and finishes it before less versatile equipment can be loaded on a flat-bed for transport.

**180° turns in 24'3" radius**

Fingertip electric kingpin power-steer, continuous 180° turns within

24'3", excellent visibility — all these advantages enable "D" to work in tight quarters and around obstructions that seriously slow down production of other types of equipment.

The "D" loads itself. Or two "D's", equipped with dozer blades, working together, can push-load each other. Unit spreads evenly to any required lift... does excellent scraper finishing jobs.

Equipped with 8-ft. dozer blade, "D" clears land, backfills, removes snow, and does other miscellaneous dozing jobs, which add to its value as a versatile small-yardage tool.

When your odd-job schedule is completed, you can put the 9-yd. D Tournapull in with a production fleet, and profitably pusher-load it to heaped capacity.

#### Interchangeable equipment

Versatile D 'Pull\* prime-mover can interchange from scraper to operate rear-dump, side-dump, flat-bed, crane, logging arch, or transit mixer. Any of these extra LeTourneau-

\*Trademark DP-1096-DC-1

Westinghouse trailing units can be purchased at about  $\frac{1}{4}$  the price of the original Tournapull scraper.

Ask for an on-the-job demonstration. See for yourself how you can "plug that hole in your pocket" with fast, "handyman" D Tournapulls. Call or write for complete information. No obligation.



D 'Pull safely handles clean-up on slab. Big, low-pressure tires distribute machine weight, roll over new pavement without damage.

Finish grading median-strips is just one of many odd jobs profitably handled by D Tournapull. Only 8' wide and within 9-ton axle-load limit, do-it-all "D" travels over highways without special permit.

**LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS**



A Subsidiary of Westinghouse Air Brake Company,

Where quality is a habit

engines. One of the principal design features is the elimination of the check valve. A self-lubricating, mechanical shaft seal is used in its place to prevent leakage. The new pumps also incorporate a new defuser priming system that permits rapid priming with a minimum of water in the pump case. The pumps' cover plates can be removed quickly for inspection. They have tapped holes

for both vacuum and pressure gages as well as a drain plug. Discharge outlets on both pumps can be changed quickly to any one of three positions.—**Marlow Pumps, Div. of Bell & Gossett, Midland Park, N.J.**

**VERSATILITY INCREASED**—A new crane hoist attachment for the American Econmobile has increased the materials handling



versatility of the vehicle. The attachment gives a hoisting height of 32 ft in the retracted position, which places the crane hook 12 in. ahead of the vehicle's front tires. In the extended position the crane can reach 28 ft from the ground and 12 1/3 ft ahead of the vehicle. In the retracted position the capacity of the machine is 1,500 lb and in the extended position it is 1,000 lb. At the ground level position the new crane hoist can reach 18 ft ahead of the wheels to pick up steel, scaffolding, etc., from stacked materials. The crane hoist attaches quickly and is interchangeable with other Econmobile work tools.—**American Road Equipment Co., 4201 N. 26th St., Omaha, Neb.**

## WISCONSIN-POWERED Equipment

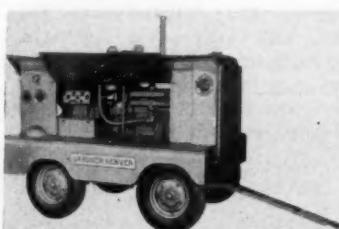
The "power barrows" you see here go over terrain and up steep inclines where ordinary "man-powered" barrows would have trouble. Each husky Wisconsin Heavy-Duty Air-Cooled Engine works Full Time, too . . . day after day, month after month, with minimum servicing.

While heavy duty features are responsible for this kind of workability, there's a more basic reason for the success of Wisconsin Engines. Long ago, Wisconsin Motor Corporation decided to build only air-cooled engines. No other products would be developed that might draw attention from this one single goal.

The plan was sound, for from these undiverted skills and know-how has come a line of engines, unmatched in features, unmatched in full time power delivery in the 3 to 56 hp. range.

**Prime Mover Co., Muscatine, Iowa is builder**

**Builder is Kwik-Mix Co., Port Washington, Wisconsin**



**LINE INCREASED** — A 210-cfm capacity portable rotary air compressor has been added to the Gardner-Denver line, which now includes models with deliveries ranging from 125 to 900-cfm. Like previous Gardner-Denver compressors, the new unit features a clutch between the engine and the compressor. For cold weather starting, the clutch is disengaged so that the engine heats up water that circulates through the compressor oil cooler and reservoir. In this way warm oil is supplied to the compressor as soon as it starts turning. An oil pump assures positive flow for compressor

Write for bulletin S-223, describing all models.



# How to solve your rock-hauling problems at low cost

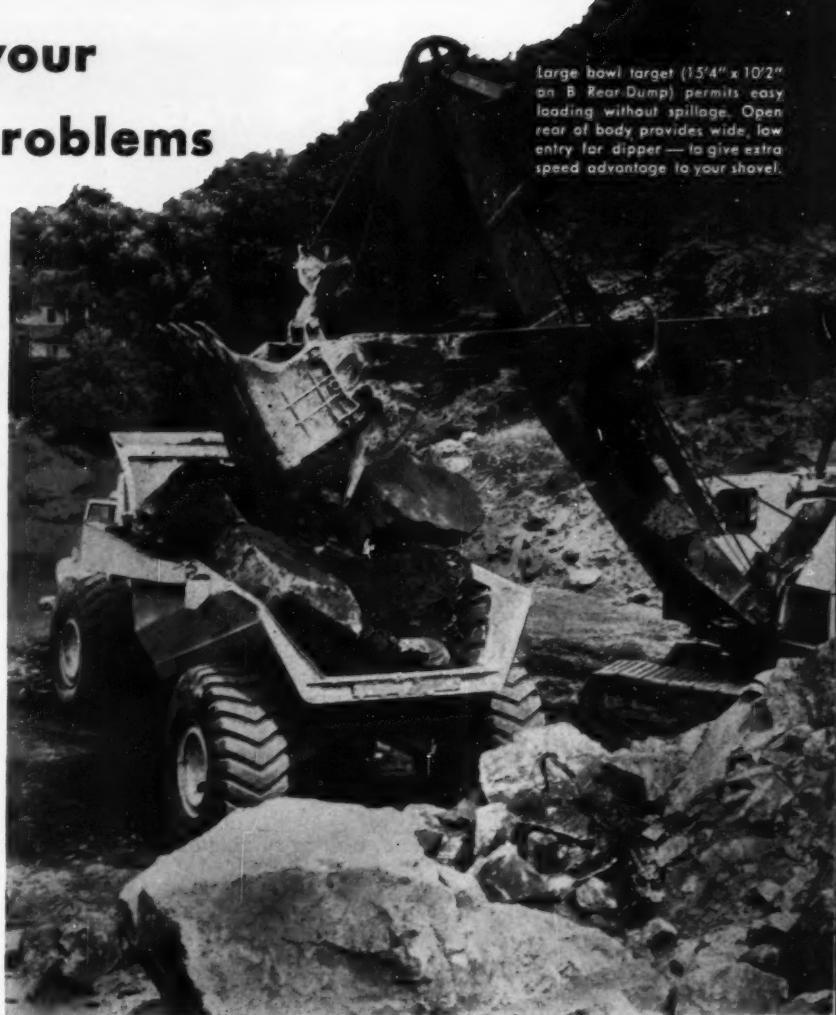
With today's highway specs calling for straight, level right-of-ways, earthmoving contractors are often faced with the problem of removing large rock formations. With LeTourneau-Westinghouse Tournapull® Rear-Dumps, you can maintain job efficiency and still keep equipment inventory at a minimum.

These high-production L-W haulers offer plenty of power, traction and maneuverability for toughest off-road earthmoving. What's more, you have the economy advantage of being able to interchange scraper, flat-bed, crane, etc., for Rear-Dump unit — behind same prime-mover.

Check the following Tournapull Rear-Dump features. They can help solve your rock-hauling problems ... and increase profits!

**Hauls anywhere** — Big single, load-rated tires let Rear-Dumps easily haul cross-country — over roughest terrain, through muck and soft fills. Unit also travels job-to-job under its own power, over paved highways or city streets. Tires do not damage paving, RR tracks, etc.

**Speeds loading** — Wide bowl, with low rear entry, makes loading easier, faster. Permits quick bucket swing-out, while dipper-door is still open. And because of large target area, spillage is greatly reduced.



Large bowl target (15'4" x 10'2" on B Rear Dump) permits easy loading without spillage. Open rear of body provides wide, low entry for dipper — to give extra speed advantage to your shovel.

Production delay for clean-up around shovel is minimized.

**Dumps fast, clean** — Just the flick of dashboard switch instantly activates point-of-action electric hoist motor. Body raises quickly to desired angle. At full dump position, edge of bowl is low behind rear wheels... so material cannot roll forward to lodge against wheels, nor pile under rear end. Smooth body sheds stickiest material readily.

**Resists body shock, damage** — Slanting walls of all-steel body, plus heavy 3-layer bottom, beat shock-load problems. Heaviest materials deflect off sloping sides... quickly

build up a shock-cushion in bottom. Reinforced bowl floor on C Rear-Dump — for example — consists of 1½" steel billets, between ½" steel bottom and a ¾" steel plate facing.

**Short 180° turns** — Rear-Dump makes continuous 180° turn in space less than hauler's own length. In dump position, it turns in only about ⅓ of overall length! This unusual maneuverability of L-W Rear-Dumps allows you to work in tight quarters where smaller conventional haulers often cannot go.

## For complete information

Why not see how you, too, can increase production, lower hauling costs with L-W Tournapull Rear-Dumps? Call or write for complete information on price, delivery, and the bonus interchangeability features. 3 sizes: 11, 22 or 35 tons.

R-1448-DC-1



**LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS**

A Subsidiary of Westinghouse Air Brake Company



Where quality is a habit

ONLY **ROGERS** HAS  
**THIS** feature  
  
and **THESE**  
Resultant Advantages

This exclusive feature makes the Rogers HYDRA-LIFT more than a detachable gooseneck trailer — one, in fact, that performs operations no other trailer can handle.

**IT** detaches, loads and reloads in as little as 3 minutes.

**IT** loads from the front, making turning on deck unnecessary.

**IT** can travel with deck lowered or raised to pass under or over obstructions thus avoiding detouring, moving ahead and reloading.

**IT** can discharge overhanging loads quickly and simply.

**IT** raises tractor or trailer wheels, while attached, to easily service tires or attach chains.

**IT'S** flat, unobstructed gooseneck provides a convenient place on which to carry dippers, bulldozer blades, etc.

**IT** requires no winch, saving up to \$900 in cost and 1000 pounds in overall weight.

PATENT NO.  
2590210



#### PACKY SAYS:

"It's 'almost like lifting oneself by his boot straps' as the literature explains."



Send for a copy ----->

**ROGERS BROTHERS CORPORATION**

ORCHARD STREET • ALBION, PENNA.

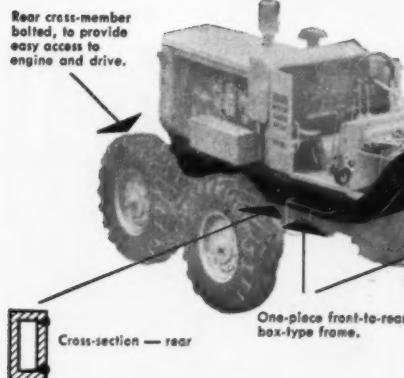
Export Office, 50 Church St. • New York 7, N. Y., U. S. A.

Cable Address: BROSITES

lubrication and cooling, and this oil flow is independent of receiver pressure under all operating conditions. Ease of servicing is another feature. The removal of 12 cap screws, all easily accessible from the rear of the machine, expose blades for inspection or replacement. The new RP210, powered by either a gasoline or diesel engine, is available on two or four-wheel mountings or on wood skids. The two wheel unit is 12 ft long including the drawbar, 67 1/4 in. wide, and 6 1/4 ft high. With the gasoline engine, it weighs 5240 lb ready to run.—Gardner-Denver Co., Quincy, Ill.



**METAL TESTER**—A new portable fluorescent penetration inspection kit for locating cracks, pores, leaks, and other defects in metal is the latest addition to Magnaflux's line of non-destructive metal test equipment. The kit, called Zy glo ZA-43, consists of a steel carrying case containing pressurized spray cans of cleaner, penetrant, and developer; a 100-w, high intensity black light; cleaning cloths; wire brushes; and complete instructions. Penetrant is sprayed on the surface of the part to be tested and capillary action draws it into any crack that is open to the surface. The cleaner is then used to remove the penetrant from the surface. When a thin film of the spray-on developer is applied, the fluorescent penetrant is drawn to the surface of any crack. The portable black light then locates flaws as a flowing fluorescent indication. The kit, which is designed especially for maintenance



Cross-section — forward



Continuous weld

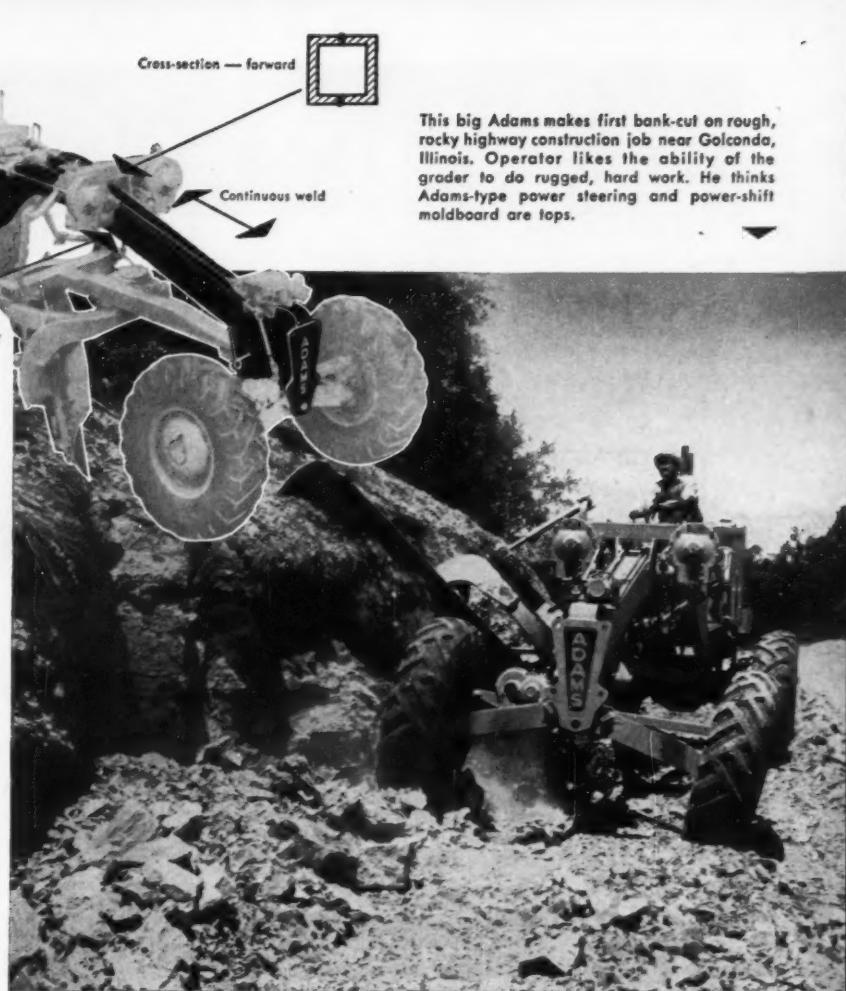
This big Adams makes first bank-cut on rough, rocky highway construction job near Golconda, Illinois. Operator likes the ability of the grader to do rugged, hard work. He thinks Adams-type power steering and power-shift moldboard are tops.

## Why your grader-frame is so important

You move dirt faster... grade at lowest cost... only when your grader accurately applies its *full* work-power to the ground. A strong, stable blade-foundation is essential if you want to work fast while you cut tough bankslopes... hold precision grades... spread big-volume fill... grade roughest haul-roads... plow-out large ditches... mix heavy windrows of base... work through rocky soil at full power.

### Extra-sturdy Adams\* frame... 1-piece from front to rear

Front-to-rear members of the Adams main-frame are heavy, steel U-channels. In the front, two full-length channels are welded together to form a box section. From top of arch to rear, each channel is boxed-in with steel plate. Frame is continuous-welded from front bolster plate to boxed-in rear-end. This forms a one-



piece, steel "wishbone" frame of rectangular box construction.

### Steady blade-mount... rigid, strong

Adams main-frame is steady and rigid under hardest day-to-day operating conditions. It provides a stable mount for the blade—no matter how tough the going. Its solid strength assures a big bite... a smooth, precise finish-surface. No faltering when work is rugged... no "riding-up", no "washboard" or deflection.

### Brawn and speed for big work-capacity

Nothing less than the husky backbone of an Adams grader could provide the super-strong foundation necessary for applying the tremendous work-power of grader's versa-

tile speed range\*\*. With more "just-right" power-speed combinations than other graders, Adams *always works closer to full-rated engine power*... digs deeper... pushes more dirt... moves it faster... cuts accurate grades thru toughest ground. Let us show you an Adams in action!

\*\*Four 80 to 150 hp standard-transmission models provide 15 full-power speeds, 0.36 to 26.0 mph, including 3 creeper gears. 190 hp POWER-Flow\* 660 with torque converter gives effective work-power of infinite number of forward speeds, 0.0 to 27.4 mph. 60 hp Model 220 has 10 speeds with optional creeper gears... best in its class. This smallest Adams has a strong one-piece front-to-rear frame, section-welded for strength, rigidity, and long life.

\*Trademark G-1302-DC-1

**LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS**

A Subsidiary of Westinghouse Air Brake Company

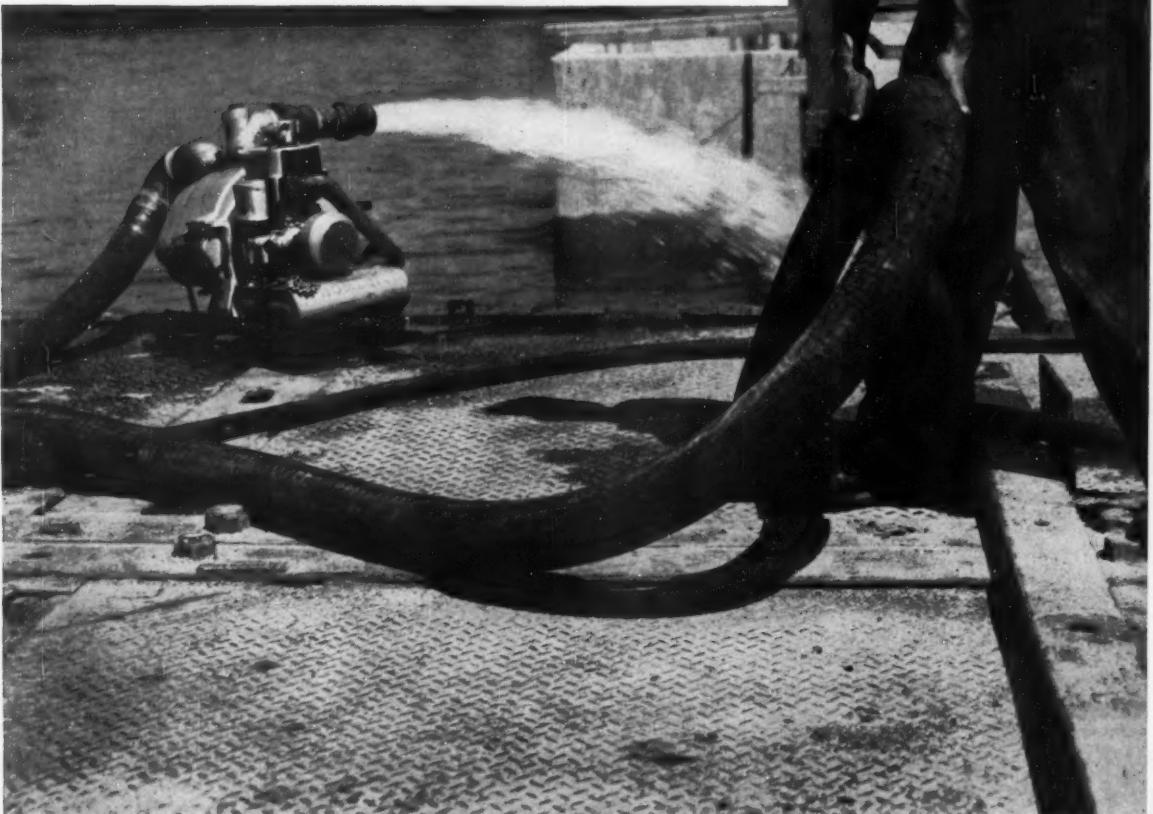
Where quality is a habit



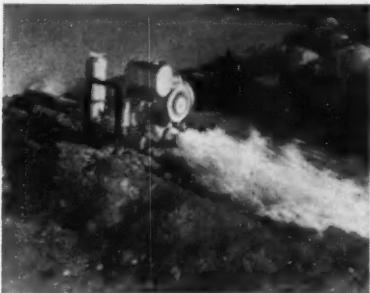
## It Gets Around

You see it everywhere . . . in spots where other pumps couldn't reach or work. One man simply picks up and carries a Homelite Gasoline-Engine-Driven Pump. He sets it up where he wants it and starts it. That's all. Fast self-priming. 28 foot suction lift. Pumps anything from seepage to 15,000 gals. per hour . . . and non-clogging. No wonder you see more Homelite Pumps on more construction jobs than any other pump. A Homelite really gets around. Ask for a demonstration on your job.

**HOMELITE**  
A DIVISION OF TEXTRON INC.  
1001 RIVERDALE AVE., PORT CHESTER, NEW YORK  
MANUFACTURERS OF CARRYABLE PUMPS  
GENERATORS • BLOWERS • CHAIN SAWS



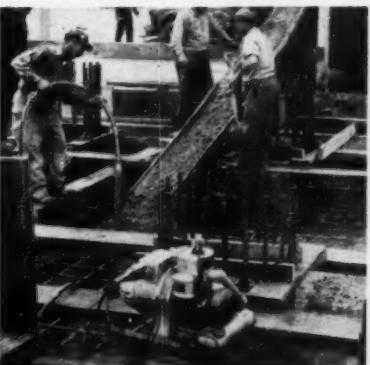
## Full Line of Carryable Construction Equipment Now Offered by Homelite



**Carryable Diaphragm Pump . . .** This self-priming, 120 pound diaphragm pump will handle water in the thickest sand, muck, or mud. Capacity: 5,000 g.p.h. Size: 3". Complete line of centrifugal pumps are also available in sizes from 1½" to 3".



**Chain Saws For Every Job . . .** Now you can choose from a full line of lightweight, powerful Homelite chain saws. From 3½ to 7 horsepower . . . 19 to 29 pounds. Brush cutting and clearing attachments are available to handle all your cutting jobs.

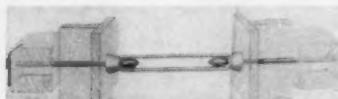


**One-Man Electric Vibrator . . .** It takes only one man to place concrete with powerful, Homelite high-cycle or universal electric concrete vibrators. Carryable Homelite generator provides power for high-cycle vibrators and 110 volt DC for all universal vibrators, tools and floodlights.

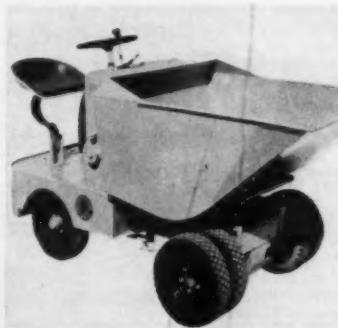
**HOMELITE**  
a division of Textron Inc.  
PORT CHESTER, NEW YORK

## EQUIPMENT NEWS . . . continued

work, overhaul tests, and for checking welds, is priced at \$125, fob, Chicago.—Magnaflux Corp., 7300 W. Lawrence Ave., Chicago 31, Ill.



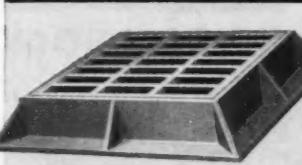
**FORM HARDWARE**—A new line of coil ties, hangers, and other hardware items for concrete form work is now available from the Dayton Sure-Grip and Shore Co. Sure-Grip coil ties with standard or tight cones are available in two-strut (above) and four-strut types in ½, ¾, 1, and 1½-in. sizes. Capacities range from 6,000 to 36,000 lb. Coil hangers, designed to speed form erection on building slabs and fireproofing beams, are available with working loads of 3,000, 7,500, and 10,000 lb per side. Several types of coil hanger frames, designed for use where beams are not fireproofed, are also available.—Dayton Sure-Grip and Shore Co., Kercher St., Miamisburg, O.



**BIGGER BUGGY**—The new Kwik-Mix Moto-Bug can carry 3,000 lb when used as a concrete buggy or platform carrier and as a forklift it will raise 1,500-lb loads to 7 ft. Carrying a full load, the Moto-Bug can climb a 25% grade, turn in an 82 in. radius. An 18-cu-ft hopper is standard. The engine on the new model, called the R-18, is side-mounted to give the operator more room. Rear-wheel steering and internal expanding brakes are automotive type. A direct drive to the power flow transmission eliminates shifting, reduced vibration, and allows 12-mph forward speeds.—Kwik-Mix Co., Port Washington, Wis.

continued on next page

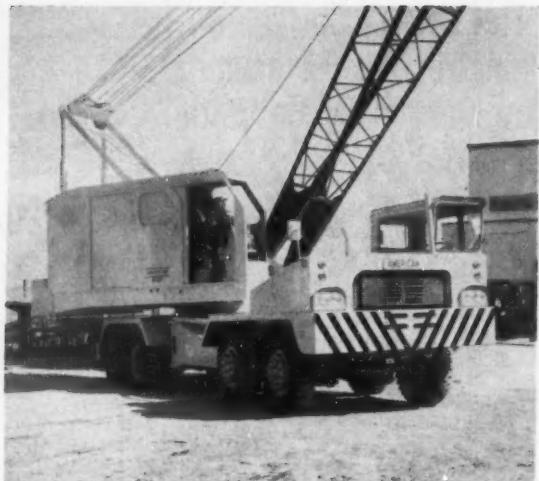
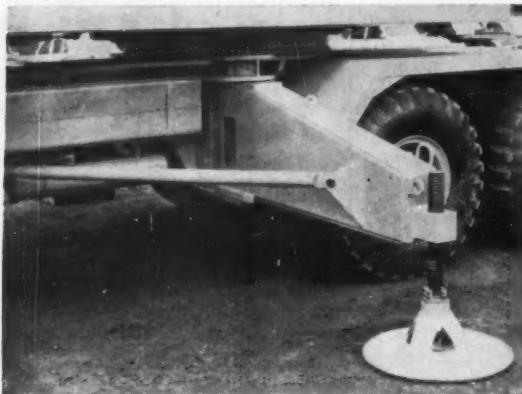
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FOUNDRY COMPANY  
**construction castings**  
of sound quality... solid value



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Chicago 31, Illinois



### New Outrigger Design Adds Capacity to Crane

American's new 40-ton truck crane features a unique outrigger system that adds to its large capacity. Called the American 500, the truck crane strips easily for over-the-road travel, yet it can handle 40-ton loads after arriving at the job site. The crane has a five-point outrigger system. Two deep center sections, slightly longer than ordinary outriggers, swing out from the carrier and lock in position. They are located almost directly under the rotating base of the machine. Two other outriggers

at the rear and one at the front make the machine stable enough to swing through a full 360-deg arc with big loads. Other features of the 500 include new air controls that provide finger-tip operation; controlled load and boom lowering; and a deep section boom with alloy steel chord angles and tubular lacing. The four-axle carrier is available in 9 or 10-ft widths.—American Hoist & Derrick Co., St. Paul 7, Minn.

continued on page 169

## an unbeatable two - some!

### BMCO'S ROCKBUSTER

Reduces over size boulders to uniform specification material for the base course right where it's needed, with one pass, one operation. Eliminates grizzlies and clean-up costs. The ROCKBUSTER can be towed by any tractor or grader that will bridge the windrow. It's perfect for reconditioning scarified asphalt to material. Eliminates extra hauling and labor on clean-up...blends crushed rock with finest natural binder...single design keeps maintenance down—time at a minimum...no gears to strip...does not beat rock into the ground.



### BMCO'S SELF-PROPELLED ROLLER

All wheels act independently in this exclusive design. It is impossible to overload any one tire...more weight is obtained because of the exclusive BMCO oscillation on all wheels...more uniform compaction is attained more quickly than with any other

roller. Patented steering system gives gradual positive turning action that's fast enough to make a quick short turn. Large hydraulic service brakes apply on all drive wheels...can be locked that way for parking.

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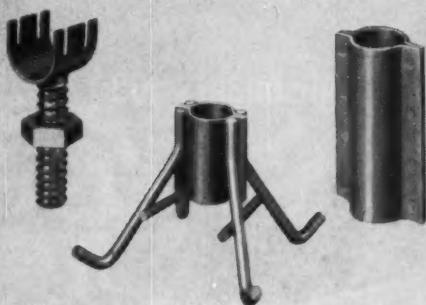


SHEEPSFOOT  
ROLLER



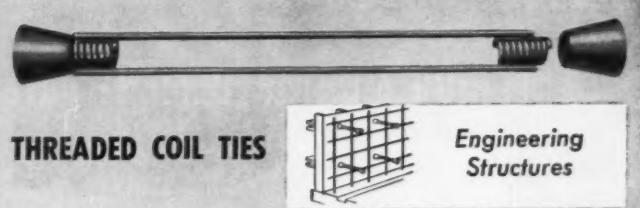
VIBRATING  
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SEE THIS LINE AT YOUR NEAREST DEALER:



**HEAVY-DUTY  
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Overpasses and  
Underpasses



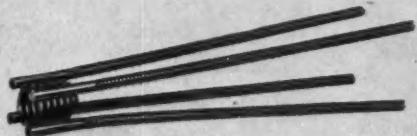
**THREADED COIL TIES**

Engineering  
Structures

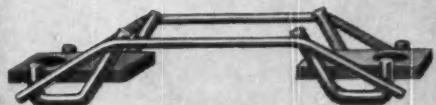


**TIILT LOCK CLAMPS**

Heavy-Duty  
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COIL ROD  
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**PLATE  
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These are examples of the numerous types of form ties, anchors, inserts, and other items in Superior's most complete line of concrete accessories. The illustrations show the variety of concrete form work and related jobs in which Superior accessories are used. All items are designed to provide the most dependable and efficient forming methods.

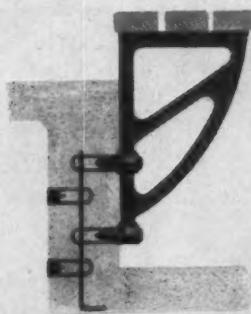
WHENEVER YOU ARE PLANNING FORM WORK... Superior's technical assistance is available to prepare suggested layouts. Call or write to nearest address shown below.

## SUPERIOR CONCRETE ACCESSORIES, INC.

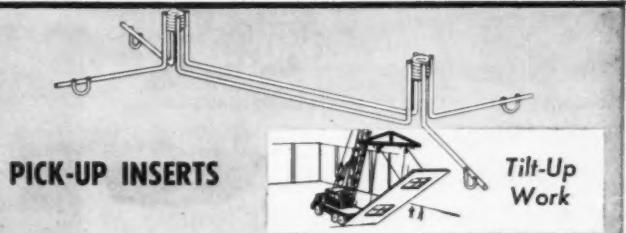
9301 King St., Franklin Park, Ill. (A Suburb of Chicago)

New York Office  
1775 Broadway  
New York 19, N. Y.

Pacific Coast Plant  
2100 Williams St.  
San Leandro, Calif.



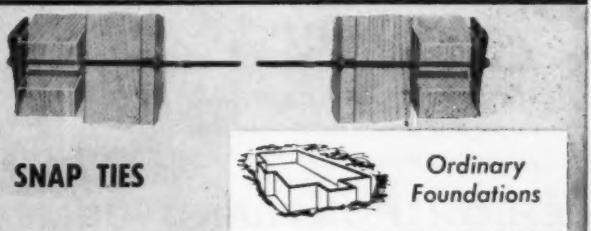
**RISER-  
FRAMES**



**PICK-UP INSERTS**



Tilt-Up  
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**SNAP TIES**



Ordinary  
Foundations

# "... LEHIGH MORTAR CEMENT gave us a high quality job..."



ARCHITECT: Abbott Associates, Boston, Mass.  
CONTRACTOR: Jefferson Construction Co.,  
Cambridge, Mass. and Miami, Fla.  
DEALER: Cook Builders Supply Co., West Springfield, Mass.

• "We were well satisfied with Lehigh Mortar Cement," wrote Mr. E. C. Connell of the Jefferson Construction Company, on completion of this classroom building.

"We achieved a uniformity of color and texture that was not possible with a cement-lime mixture.

"The workability and plasticity of Lehigh Mortar Cement gave us a high quality job and lowered masonry costs.

"The many compliments we received on the masonry work are due to good masons and to Lehigh Mortar Cement."

Try Lehigh Mortar Cement and see for yourself how it helps produce quality masonry construction.

- LEHIGH MORTAR CEMENT
- LEHIGH PORTLAND CEMENT
- LEHIGH EARLY STRENGTH CEMENT
- LEHIGH AIR-ENTRAINING CEMENT

**LEHIGH PORTLAND CEMENT COMPANY**  
Allentown, Pa.

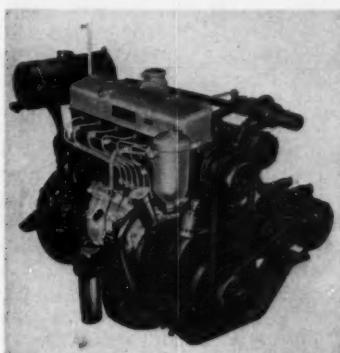
Classroom building of the new Westfield State Teachers College,  
Westfield, Mass.



Typical classroom interior. Lehigh Mortar Cement was used  
in attractive concrete masonry walls.



Glazed tile and glass block in gymnasium walls were also laid  
up with Lehigh Mortar Cement.



**IMPORTED ENGINES** — Several industrial models of Mercedes-Benz diesel engines are now available in the United States through the Utica Bend Div. of the Curtiss-Wright Corp. The OM312 (above) is rated at from 50 hp at 1,400 rpm to 79 hp at 2,400 rpm; the other available engine, the OM636, is rated at from 20 hp at 1,600 rpm to 36 hp at 3,000 rpm. Both are extremely lightweight and compact. The 20-36-hp model is a four-cylinder, water-cooled engine measuring only 32 in. high, 23 in. wide, and 27 in. long. The 50-79-hp power plant, which has a 19.5:1 compression ratio, is only 41 in. high, 36 in. long, and 28 in. wide. It weighs 990 lb. Both engines feature aluminum pistons, chromed cast iron cylinder blocks, and an efficient pre-combustion chamber system that relies on Bosch injection pumps and nozzles. Both are available with either heat exchanger or radiator-cooled systems that meet a variety of applications. — Curtiss-Wright Corp., Woodridge, N.J.



**VERSATILE CLEANER** — Clayton's new Blast-Master steam cleaner delivers all or any part of 280-gal of cleaning solution—a feature that makes it possible to

## More and More Manufacturers are Installing MARVEL SYNCLINAL FILTERS AS STANDARD EQUIPMENT

Manufacturers of hydraulically actuated equipment and others with low pressure liquid circulating systems demand their equipment to perform consistently with all the productive efficiency they build into the machine that bears their name. Since these systems must be kept free of damaging particles, the selection of a filter is an important factor. Here are some of the outstanding reasons for the increasing preference for Marvel Synclinal Filters to do this all-important job!



SUMP TYPE  
(cutaway)

**BECAUSE** . . . Marvels are designed to give maximum ACTIVE filtering area rather than total filtering area. Only ACTIVE FILTERING AREA COUNTS!

**BECAUSE** . . . Marvels greater storage space for filtered out particles allows longer periods of "production" time at absolute minimum in maintenance cost and "down-time."

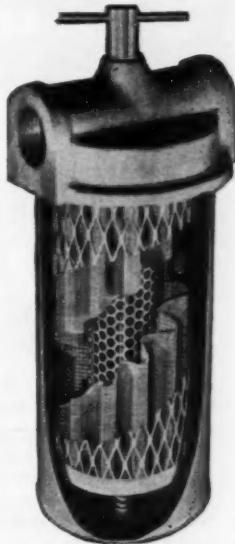
**BECAUSE** . . . Marvels can be disassembled, cleaned and reassembled by any workman in a matter of minutes. Line type operates in any position and may be serviced without disturbing pipe connection.

**BECAUSE** . . . Marvels are protected and of sound construction to give long life and efficient filtration.

**BECAUSE** . . . Marvels (Both Sump and Line Type) are available in individual capacities from 5 to 100 G.P.M. and choice of mesh sizes ranging from coarse 30 to very fine 200, they get a filter to fit their specific requirements.

**BECAUSE** . . . Marvel not only delivers a top grade filter in both quality and performance, but delivers IMMEDIATELY—shipments are made the same day orders are received, if desired.

### They Meet J. I. C. STANDARDS



LINE TYPE  
(cutaway)

### FACTS — NOT CLAIMS

Engineers decide on the basis of the record, on the basis of measurable facts rather than claims of the "campaign premise" variety. Here is a fact with meaning—

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For Dependable Protection on  
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Without obligation, please send me complete data on Marvel Synclinal Filters, as indicated:

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- Catalog No. 200—For Fire-resistant Hydraulic Fluids (Aqueous Base)
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the BEST...**

**MANGANAL**

14% - 13½%  
**MANGANESE-NICKEL STEEL**

## BARE WELDING ELECTRODES

**TOP WELDERS CHOOSE MANGANAL BARE** because:

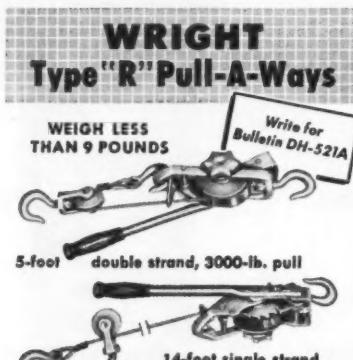
- 1. It makes the strongest welds fastest.
- 2. No coating; no slag; no chipping.
- 3. Workhardens to 550 Brinell; tensile strength, 150,000 psi.
- 4. 100% metal deposit; every ounce counts.

For the most effective and economical reclamation welding of parts worn through impact and abrasion.

**STULZ-SICKLES CO.**  
PORT AVENUE at JULIA ST. ELIZABETH, NEW JERSEY

**NATIONAL WELDING EQUIPMENT ASSOCIATION MEMBER**  
SOLE PRODUCERS

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**Sturdy • Light • Safe • Economical**

Here are some of the fine features of  
**WRIGHT Type "R" Pull-A-Ways:**

Drop forged ductile aluminum alloy frame • Wire hoist cable of maximum strength and flexibility • 8" minimum handle movement—for close hook-ups • 2" drum hub for cable • No oiling needed • Drop forged steel hooks • Removable, reversible "Safety Handle" that bends before any part of hoist is overloaded • Automatic load lowering, with positive control for safety.

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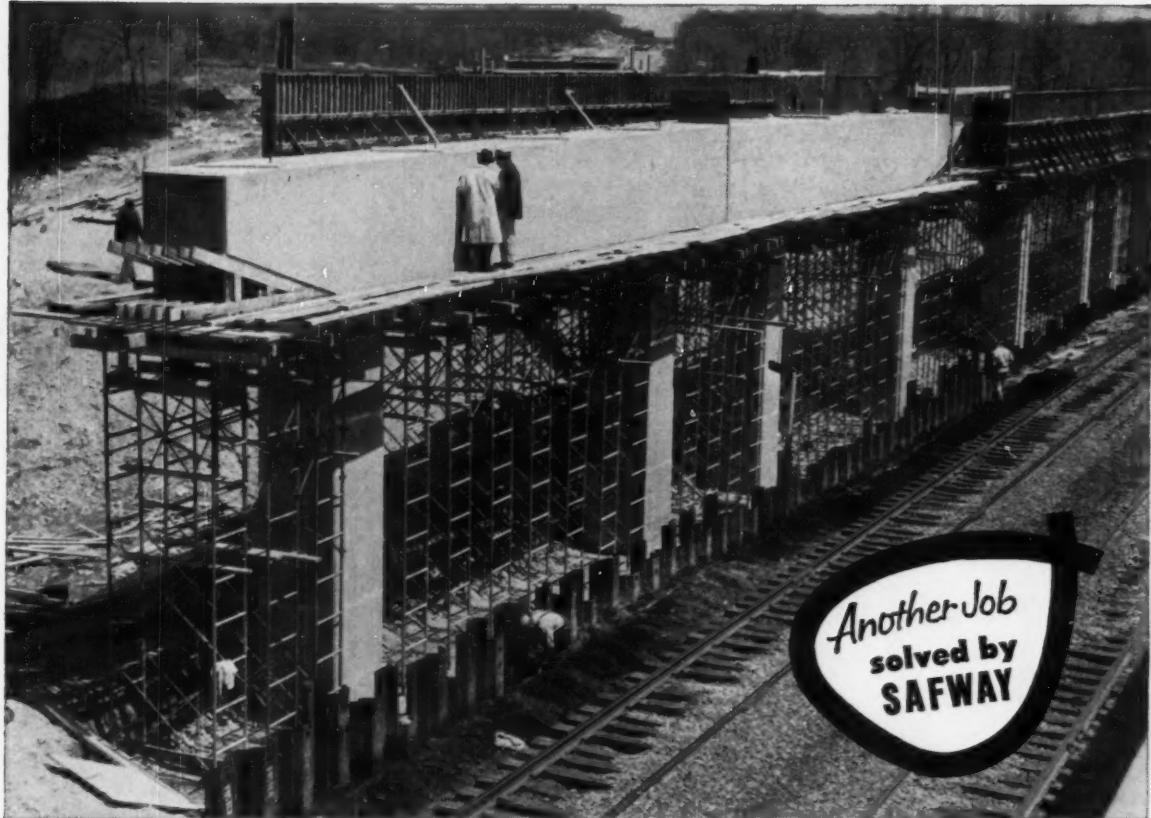
Company Promotion Dept. . . Room 2710  
McGraw-Hill Publishing Co., Inc.  
330 West 42nd Street, New York 36, N.Y.

use the cleaner economically for small, medium or large cleaning jobs. Clayton's new control system, called Fleximatic, automatically regulates fuel to the burner and water flow to the coil capacity so that the operator can select all or any part of the cleaner's 280-gal capacity for one or two guns. Clayton's vacuum nozzle, a feature of the new gun, is designed to control vapor expansion so that the blast is concentrated and of high velocity. In tests, the cleaner has performed effectively when the nozzle was up to 4½ ft away from the object to be cleaned, according to the manufacturer.—Clayton Mfg. Co., 401 N. Temple City Blvd., El Monte, Cal.



**MEASURES TREAD** — A precision instrument designed to measure the tread depth of truck tires has been developed by the Dill Manufacturing Co. Called the model 5096 tread depth gage, the instrument provides an accurate means for gaging treads when mating dual tires. It also permits a quick safety check by measuring the remaining life of a tire, and it can be used to set up tire rotation schedules. The all-metal gage, which has a handy pocket clip, is graduated in 1/16-in. increments up to 5 in. — Dill Mfg. Co., 700 E. 82nd St., Cleveland 3, O.

**STOPS OIL FOULING** — A new auxiliary-gap spark plug for use in engines that are particularly susceptible to oil and carbon fouling has been developed by the Champion Spark Plug Co. The new spark plug incorporates an additional gap at the top of



*Shoring a 4'x6'x87' Bridge Beam on the Massachusetts Toll Road*

## Bridge Shoring Method Saves 60%

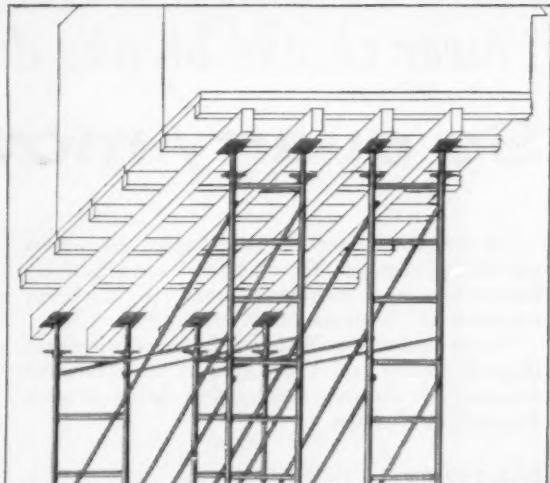
### SAFWAY STEEL FRAME SCAFFOLD CUTS TIME AND MATERIAL COST

THIS 4 BY 6 FT. BEAM was shored with Safway steel scaffolding for faster handling, greater convenience, safety and lower ultimate cost. And overall savings amounted to about 60% of the cost of ordinary timber shoring, according to the M. De Matteo Construction Co., who handled the job.

Loads are carried on the tubular steel legs of the scaffolding, braced in two directions. Careful calculation established the number of scaffold frame legs and size of wood beams and joists required to support the concrete. Extended platforms made it easy for men to set and strip side forms.

Safway scaffolding goes up quickly, without tools. Screw jacks compensate for uneven ground and permit final leveling of formwork. As work progresses, complete shoring towers can be moved without disassembly. And the contractor recovers 100% of his scaffold equipment.

**CONSULT SAFWAY ENGINEERS**—Learn how you can cut shoring costs! Call your nearby Safway office for planning and erection service—ample stocks are available for *sale or rental*. Submit job details for recommendations (no obligation). And **WRITE TODAY FOR BULLETIN 181.**



*Proper spacing of shoring columns is determined by total load and capacity of the lumber. Safway scaffold frames are available in a number of sizes to meet every spacing requirement, permitting beam loads to be carried directly on column legs rather than horizontals.*





*Power shovel breaks down . . .*

## **So quarry moves boulders with**

All over the country, more and more dirtmovers are finding Michigan Tractor Shovels can effectively handle jobs once considered much too tough for rubber-tired equipment.

You've probably read about—or seen—Michigans digging pit-run gravel. Or breaking out reinforced concrete. Or clearing brush. Now here's another dramatic application.

### **Maintains pit production**

The company involved, a large northeastern firm, had always had trouble maintaining pit production when any of their big power shovels broke down. One time this happened, they had a Michigan Tractor Shovel in the pit on demonstration. They decided to put it through the rugged test of rock loading.

### **Now own six Michigans**

That was in 1954. Today, this company owns six Michigan Tractor Shovels! In emergencies these units

effectively handle both rock loading and cleanup. They also handle all truck-loading of screened aggregates and other products of the multi-million-ton crushed stone plant. Management estimates their output "definitely greater" than output of loaders formerly used. Maintenance costs, over periods ranging up to three years, have been "satisfactorily low".

### **Boulders weigh up to 7 tons each**

Note the photos. Above, one of the company's five  $2\frac{3}{4}$  yard Michigan Model 175A's is moving huge boulders to stockpile for later sale as rip-rap. Each chunk weighs  $\frac{1}{2}$  to 7 tons . . . yet at no time has operator reported trouble handling them. Upper right, another Model 175A loads shot rock at the quarry face. Michigans' unobstructed dumping height, power shift, and power steer helps speed both emergency assignments.

### **Load 10 tons in 2 to 3 minutes**

Stockpile loading (lower right) keeps the company's

*(Advertisement)*



This is the type of shot rock that must be loaded into trucks for transport to crushers. Michigan Tractor Shovels must be able to take a lot of punishment—and they do!



A full bucket every time saves trips, cuts handling costs of loading crushed stone or sand. This load weighed out at 7,000 lbs. This model Michigan can lift 15,000 lbs.

## 2 $\frac{3}{4}$ yard Michigan

2 yard Model 125A and most of the 2 $\frac{3}{4}$  yard Model 175A's busy most of the time. Good mobility and unexcelled breakout, *equally great* through the entire lifting arc, make quick work of this job. The Model 125A needs only 3 minutes to heap a typical 10 yard truck . . . the bigger Model 175A's require only 2 to 2 $\frac{1}{2}$  minutes.

### 24 mph travel speeds odd jobs

Michigan speed pays off on odd jobs, too. Like cleanup of haul roads, stockpiles, and around crushers. Pushing loaded trucks up grade. Setting utility poles. Hoisting crusher screens and other heavy equipment. Switching railroad cars (up to 25 empties at once). Plowing and removing snow. Despite year-around work averaging 50 hours a week, company officials report "downtime negligible." And continuing, "The all-Clark-built, all-matched power train sure boosts efficiency. From power shift, power steer and 3-to-1 torque converter to planetary wheel drive axles . . . our '54 model has the same components as our newest rig . . . which certainly proves

how good the Clark design is. We like the speed of loading . . . the speed between job sites . . . the excellent performance on emergency rock-handling . . . the lack of downtime . . . the ease of maintenance. That's why we've been repeat-buyers five times!"

### Make your own test

A demonstration, gladly arranged by your local Michigan Distributor, will show you why you too should be a Michigan Tractor Shovel buyer. Put the demonstrator on your toughest loading jobs . . . we'll bet *our cost of the demonstration against your time* you'll really be enthusiastic about the results.

Michigan is a registered trade-mark of

**CLARK® EQUIPMENT**

**CLARK EQUIPMENT COMPANY**

Construction Machinery Division

2403 Pipestone Road

Benton Harbor 42, Michigan

In Canada: Canadian Clark, Ltd.,

St. Thomas, Ontario

the center electrode that causes an increase in voltage at the firing end of the spark plug to help overcome oil and carbon fouling. Although the idea is not new, it found only limited application until the advent of high-output engines, many of which use so little of their potential power at low speeds that the plugs do not become hot enough to burn off oil and carbon deposits. In addition

to their application for vehicles that operate under low-temperature conditions, the auxiliary gap plugs are effective in air compressors, generators, and other engines where operation alternates between sustained constant speeds and idling. Champion plugs currently being produced with auxiliary gaps are the UD-16, UJ-12, and UJ-6.—Champion Spark Plug Co., Toledo, O.

## it takes ONE MAN just **2** minutes to load...



Model "OT"-13  
tandem \$2,295.00\*

rigs up to 13 tons on a  
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\*F.O.B. Milwaukee

Complete with platform and tires.  
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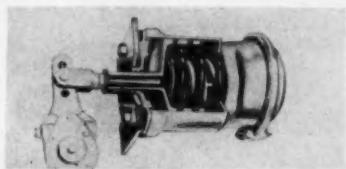
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**EXTRA BRAKE**—An air-released attachment that automatically applies air brakes when the air supply is depleted has been developed by the Maxi Corp. Called the Maxibrake, the attachment is installed between the service brake chamber and its mounting bracket. It does not affect the operation of service brakes unless the reservoir air pressure falls below 60 psi. When pressure does fall below 60 psi, the attachment begins to apply the brakes by exerting force to the brake chamber push rods. The driver controls the Maxibrake through a hand valve located in the cab. With the hand valve, the driver also can use the attachment to assure safe parking.—Maxi Corp., P.O. Terminal Box 3129, Los Angeles 54, Cal.



**ADJUSTABLE SPREADER**—A base spreader box that features lift wheels that can be raised or lowered independently of each other to lay passes from  $\frac{1}{2}$  to 8-in. deep has been added to the Cmetco Rola Paver line by Creative Metals Corp. While the unit is designed primarily for spreading cement-treated or crusher-run base, it can also handle asphaltic mixes, according to the manufacturer. The adjustable lift-wheel feature enables the spreader to lay either uniform or tapered thickness, and it can be used to overlap a previous pass even when one wheel must ride on the completed pass. Independent lift wheel operation is accomplished through manually operated screw jack controls that are mounted close to screed con-



*Analyzing his Michigan Tractor Dozer, Sanders Construction Corporation president says "it will pull as much as a 14 ton crawler, yet is much faster between jobs, much cheaper to maintain."*

### **Here the 165 hp rubber-tire rig**

## **STARTS, SKIDS 60,000 lb LOAD**

Under contract for the \$20,000,000 Cousin's Island steam electric generating station at Yarmouth, Maine, Sanders Construction Corporation, Portland, went to work facing a typical Maine winter. Despite cold weather and heavy snow, they completed the job on schedule—and at a nice profit. Prominent in their successful operation was a single piece of extremely versatile equipment—a Michigan Model 180 Tractor Dozer.

#### **Tows 55 tons up snow-slick grade**

This rubber-tire unit did a wide variety of pulling, pushing, and lifting jobs. It once hauled a 43 ton set tank on a 12 ton trailer *upgrade* . . . and did the job with several inches of snow on the ground—and more falling. It regularly skidded 10 to 30 tons of sled-loaded structural steel (illustrated).

Footing on this assignment was often abrasive gravel or sand . . . much of the way uphill . . . but at no time did the four-wheel-drive Michigan have trouble starting or skidding the big loads. It also skidded sleds of 12 inch cast iron pipe . . . pulled machinery . . . graded and, with its low-pressure tires, compacted the area for landscaping.

#### **Will do almost any job**

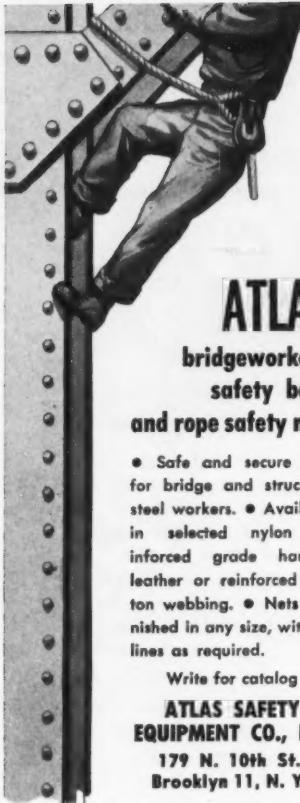
"On the basis of performance, we feel there's hardly anything a Michigan Tractor Dozer won't do," says Mr. Sanders. "Of course, there are a few soil conditions in which it—and any other machines on rubber—just won't work. But anywhere rubber *will* work—and that's most of the time—we'll take the Michigan over ANY crawler-dozer in its size class (14 tons)! It does most jobs a lot faster. It moves around faster (up to 27 mph). Its maintenance costs

are lower. Operators like its power shift and power steer. And we like its price . . . about \$6,500 less than other big rubber-tire dozers."

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**EQUIPMENT NEWS . . . continued**

trols. Like other Rola Paver spreaders the adjustable front-wheel spreader is truck towed while paving by means of a chain and harness that reaches to the front bumper of the truck. The unit is moved from job to job by means of a simple chain attachment to the rear of the dump truck body. Under ideal conditions, the spreader has the capacity to lay base materials at the rate of 20 10-yd truck loads per hr, according to the manufacturer. Time studies show that the spreader can receive and lay a load in 1½ min. — Creative Metals Corp., 1290 Powell St., Emeryville, Calif.

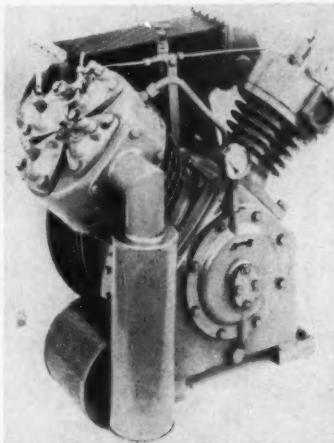


**ENGINEERING MATERIALS HANDBOOK**

Gives answers by a number of specialists to both routine and specialized questions regarding the choice of engineering materials. Considers materials from the viewpoint of engineering structures, machinery, and equipment, and includes technical tables, design information, etc. Edited by Charles L. Mantell, Consult. Engr.; Newark College of Engrs. 1906 pp., 648 illus., \$21.50

**DESIGN OF CONCRETE STRUCTURES**

New 6th Edition. A compact, handy guide to the most important phases of designing simple structures. Covers theory, methods, and practical examples of reinforced concrete structures. Covers all changes in the 1956 ACI Building Code. By Leonard C. Urquhart, Consult. Engr., and George Winter, Dept. of Struct. Engr., Cornell U. 6th Ed., 564 pp., 259 illus., \$8.00



**NEW COMPRESSORS** — A new series of continuous duty air compressors with ratings of from 47 to 105 cfm at 100 psi have been added to the Atlas Copco line. Ranging in weight from 440 to 595 lb, they may be installed either as stationary or portable units direct-coupled to either high-speed electric motors or to a V-belt drive from a diesel engine. All models in the series are air-cooled, two-stage, two-cylinder, single-acting compressors. Cast-iron finned cylinders are arranged in a "V" on the crankcase. Bearings are pressure-lubricated from a gear-type pump operating from the end of the crankshaft as lubricants are forced through the hollow crankshaft and rifle-drilled connecting rods. Sizes of the new compressors range from 25x25x29-in. for the NT-7 to 29x30x34-in. for the largest in the line, the NT-9.—Atlas Copco Eastern, Inc., 151 Linwood Ave., Patterson, N.J., or Atlas Copco Pacific, Inc., 930 Brittan Ave., San Carlos, Calif.

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**MANAGEMENT FOR ENGINEERS**

Provides the engineer with the know-how for undertaking management relations and responsibilities. Chapters discuss production costs and their control; the basic financial transactions of a business enterprise; the concepts of authority and responsibility; and the higher level decision-making process. By Roger C. Heimer, Villanova Univ. 453 pp., \$6.75

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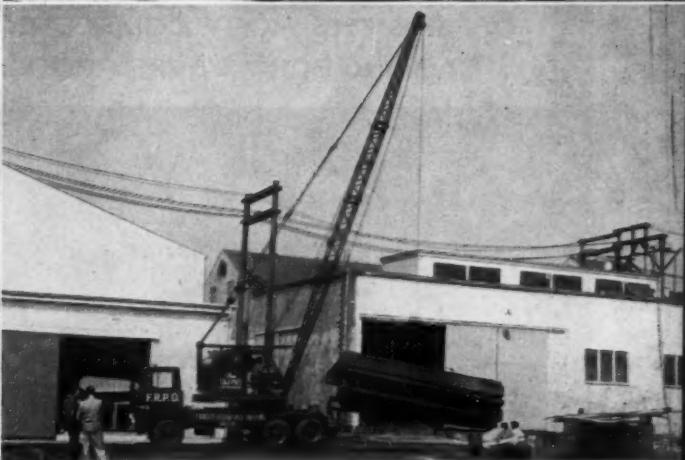
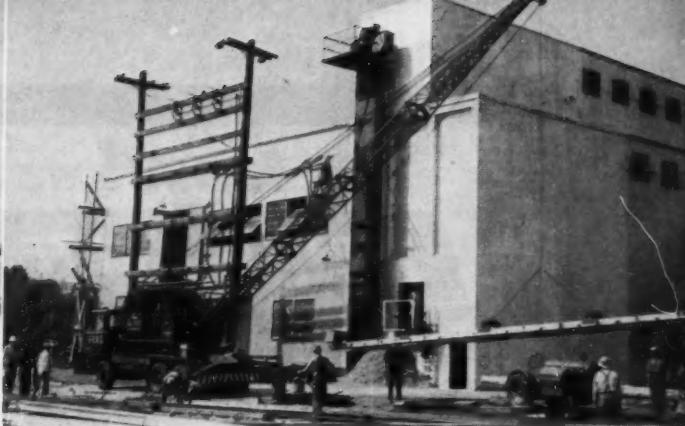
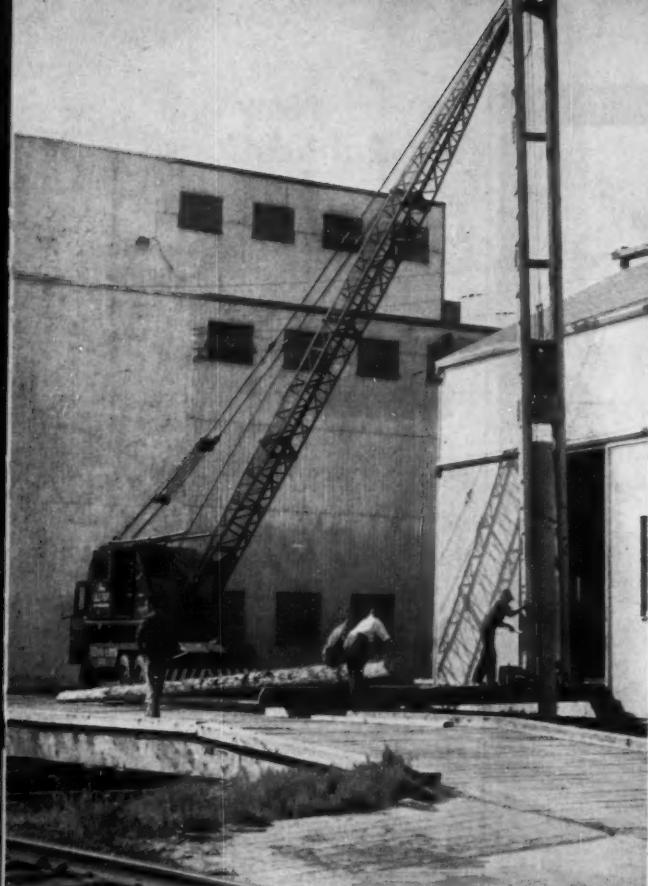
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## **Versatile Michigan 15-ton Truck Crane handles entire railroad trestle project —ALONE!**

Michigan cranes are nothing new to Fraser River Pile Driving Company, Ltd. (New Westminster, British Columbia)—they've owned eight of them. Still, there's something pretty special about being able to say "Send a Michigan" . . . knowing this *one machine alone* can handle a crane or shovel job quickly, efficiently, *profitably*. A case in point is the railroad trestle Fraser built recently for Pacific Veneer Division of Canadian Forest Products, Limited.

### **Drives to job at traffic speeds**

To get work started with minimum delay, Fraser's 15-ton Michigan truck crane was driven in to the job over main highways. Unit was light and

narrow enough to need no highway permit. Its first assignment was pile driving. A 35-foot tower was assembled to the boom end and raised into position; a 3600-pound hammer slammed dozens of pilings into place. Michigan's maneuverability really shone here, for it carried—and placed—all trestle timber and sections of pre-built bridge flooring, *as well as* the big pilings. And to finish matters, they later put a clamshell on the Michigan and cleaned up underneath the finished trestle.

### **"Very pleased with our 8 Michigans" says owner**

It's easy to see why Fraser River Pile Driving Company has been "very pleased" with the performance of their

eight Michigan Cranes. Chances are, rugged, versatile drive-anywhere units like these could cut *your* equipment headaches, too. Your local Michigan Distributor will be glad to work with you. No obligation, naturally. Or write direct to us for detailed specifications.

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## New Publications

These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy, write directly to the manufacturer at the address given.

**PRESTRESSED CONCRETE**—Data on standard prestressed concrete building sections is contained in a new data folder called "Prestressed Concrete." Dimensions, physical properties and tables of loading are given for double tees, channels, joists, and other shapes. Also included is an article about the Leap Company itself. — Leap Associates, P. O. Box 1053, Lakeland, Fla.

**BITUMINOUS DISTRIBUTOR**—Details of the Littleford Model D "Spray Leader" bituminous distributor are contained in their new bulletin HH-30. This machine is a heavy-duty bituminous distributor, equipped to handle every type of bituminous material.—Littleford Bros., Inc., 453 E. Pearl St., HH-30, Cincinnati 2, Ohio.

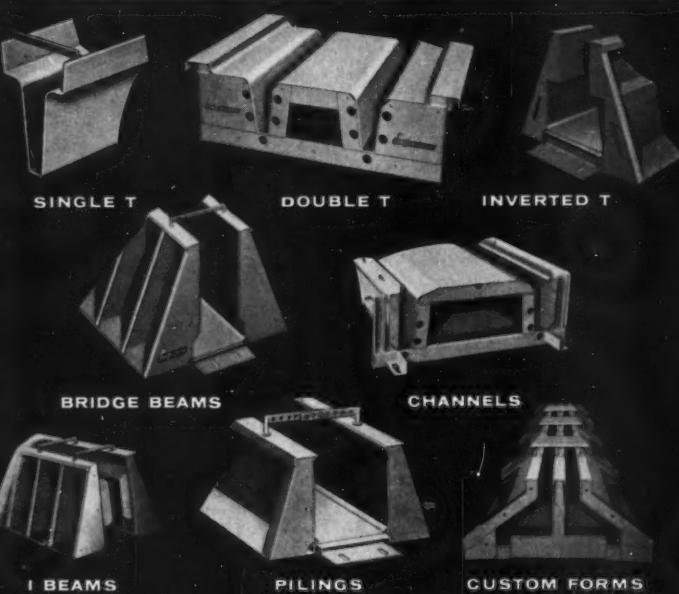
**FIR PLYWOOD**—"Basic Facts about Fir Plywood Diaphragms" is a collection of all available data on this subject. It explains how diaphragms work to withstand earthquake and wind pressures, a comparison of plywood with other materials, design data, cost figures and specifications.—Douglas Fir Plywood Association, Tacoma 2, Wash.

**WELDING TECHNIQUE**—A 12-p booklet, "EB Weld Insert," describes a patented consumable insert method of making a sound root pass weld when only one side of the weld is accessible. It compares this system with conventional methods and gives specifications, 15 types of insert, and recommended filler rods.—Arcos Corp., 1500 S. 50th St., Philadelphia 43, Penna.

**LORAIN CATALOGS**—Two new catalogs have been published by the company. A 16-p catalog gives details of the newly-introduced self-propelled, shovel crane, Model SP-107. Another new addition to the Lorain line is the 35-ton Moto-Crane, model



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Fully automatic, the HP-85 is handled by *only one operator*. It can be operated at low speeds as well; provides economical operation for any production requirement.

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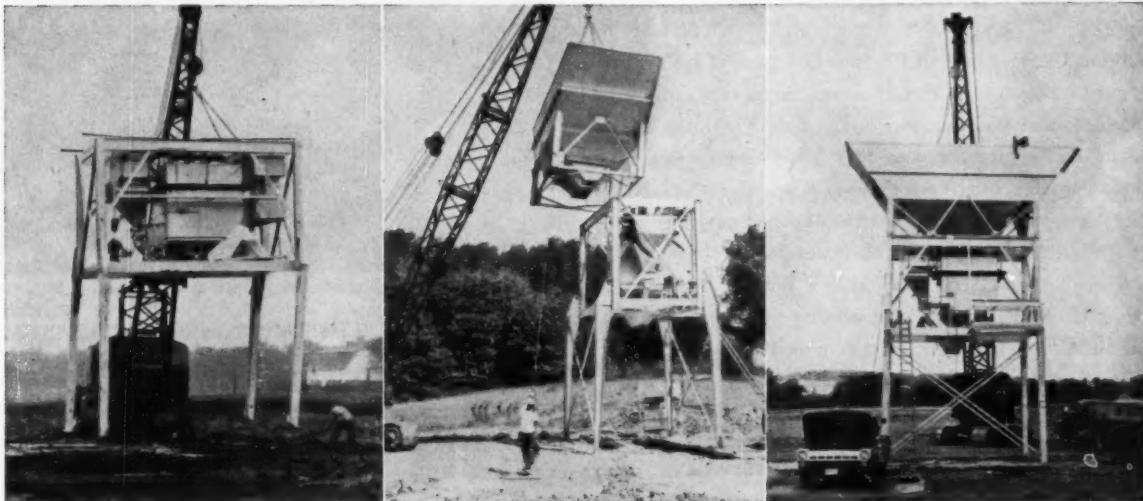
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① Low bed trailers deliver the HP-85 to your new job site. Batchers are a complete unit with automatic controls, weighing equipment piping and wiring all in place... Here crane lifts batcher section. Support columns are hinged to batcher frame, swing into place as batchers are raised.

② Almost up. A minimum of field bolts hold columns securely.

③ Crane now lifts complete, compartmented bin section, places it over batchers.

④ Attach the elevator in one piece... And the BUTLER HP-85 is ready to go! You're there with 200-plus yards capacity.



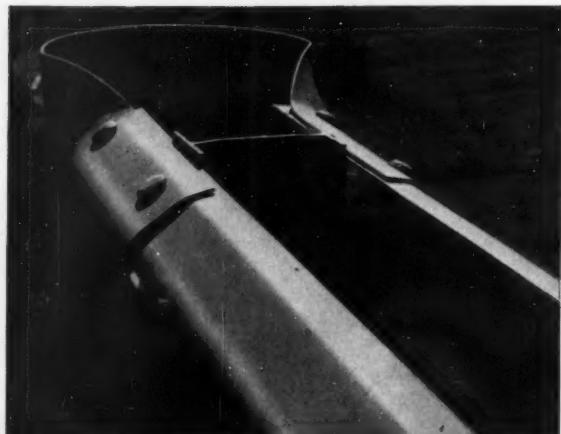


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Mounted back to back on steel posts and installed as a median barrier, Bethlehem Beam Guard Rail provides a double strip of steel, strong enough to withstand severe shocks from colliding vehicles from either side. Yet it is flexible enough so that in most cases, the vehicle is redirected parallel to the rail with minimum damage to vehicle and rail.

Beam Guard Rail comes in standard 12 ft 6 in. lengths of either 12 or 10 gage steel. However, lengths and fitting-up specifications can be adopted to any need. Currently, Beam Guard Rail is installed as median dividers on the Pennsylvania Turnpike, New York Thruway, Connecticut Turnpike, New Jersey Turnpike, the Merritt Parkway, and highways in Illinois, Maryland, and other states.

We will gladly send you our new booklet "Bethlehem Beam Guard Rail," No. 435, which gives full details and specifications. Just contact the nearest Bethlehem sales office, or write to us direct at Bethlehem, Pa.



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**NEW PUBLICATIONS . . .**  
continued

MC-530. This is described in an 8-p catalog.—The Thew Shovel Co., Loraine, Ohio.

**EXCAVATOR-CRANE**—A 22-p, well-illustrated, booklet describes Clark's Model T-24 excavator-crane. One section of the booklet is devoted to the truck and its features; a second section covers characteristics of the upper mechanism; and the last section lists the front end attachments available.—Clark Equipment Co., Construction Machinery Div., Benton Harbor, Mich.

**WINTER LINERS**—A 4-p folder describes the new assortment of winter liners for all protective hats marketed by the Mine Safety Appliances Co. Also included are descriptions of liners with no metal parts and with special insulation for protection against electrical shock.—Mine Safety Appliances Co., 201 North Bradock Ave., Pittsburgh 8, Pa.

**TRUCK CATALOG**—An 8-p, full-color catalog describing six heavy-duty International all-wheel-drive truck models of cab-forward design has been issued by the motor truck division. It covers the models in the AC-170 (4x4), AC-180 (4x4), ACF-170 (6x6), and ACF-180(6x6) series.—Form CR-205-G, Consumer Relations Department, International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

**SHORING**—“Bulletin A-130” demonstrated how Safway frame-type tubular steel scaffolding can cut costs over older methods. It describes how the equipment can be adapted to fit any job requirement, gives specifications and actual examples of how the scaffolding has been used.—Safway Steel Products, Inc., 6234 W. State St., Milwaukee 13, Wis.

**BULK TANKS**—A folder and price list describes Butler's system of bulk storage for free flowing dry granular materials. Their Bulk-O-Matic bolted tanks provide efficient storage for this type of material at less cost than welded structures.—Butler Mfg. Co., Public Information Department, 7400 E. 13th St., Kansas City 26, Mo.

continued on next page

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## NEW PUBLICATIONS . . .

continued

**WELDING CATALOG**—A new 48-p catalog on supplies and accessories for gas and arc welding is available. It contains complete information on welding rods, fluxes, brazing alloys, protective equipment of various kinds, electrode holders, hoses, and other items.—Form ADC 848B, Air Reduction Sales Co., 150 East 42nd St., New York 17, N. Y.

**TRACTOR CATALOG**—"The Complete Line of Contractor Proven High Capacity Equipment" is a catalog covering the complete line of M-R-S diesel wheel tractors and allied equipment for use with these tractors.—M-R-S Manufacturing Co., Flora, Miss.

**BIBLIOGRAPHY**—A comprehensive set of bibliographies of articles that have appeared in the Welding Journal since 1937 has been prepared by the American Welding Society. Articles are grouped under 28 headings for easy reference. Complete set of 28 costs \$5. Single bibliographies are 50¢.—American Welding Society, 33 West 39th St. New York 18, N. Y.

**SLING CHAINS**—Bulletin DH-54 on "Accoloy Kuplex Sling Chains" has been published by the American Chain Division. It contains data on choosing proper chain size and style, working load limits at various angles, basic components required to make a sling, and information on assembly and repair of slings.—American Chain and Cable Co., Inc., 929 Connecticut Ave., Bridgeport 2, Conn.

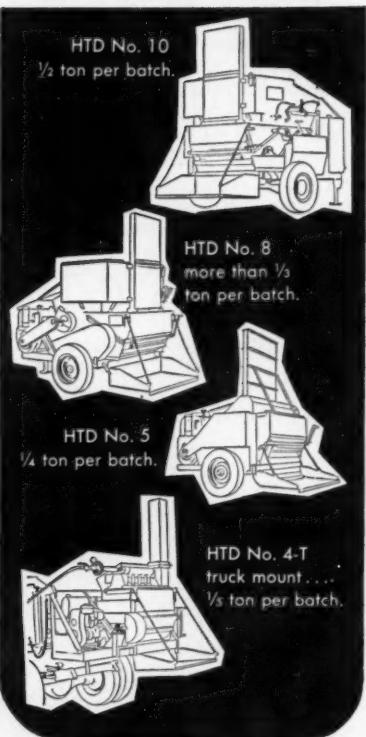
**RIPPERS**—"Ripper Report" covers a wide range of uses for the four sizes of tractor-mounted rippers made by Caterpillar. It also contains a chart comparing the costs and differences between blasting and ripping.—Form D757, Advertising Division Caterpillar Tractor Co., Peoria, Ill.

**GUNITE DATA**—Bulletin 130, "Structural Repair with Gunite" compares repair work using gunite with replacing the structure. Several case histories are analyzed step by step.—Gunite Contractors Association, 714 W. Olympic Blvd., Los Angeles 15.



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Now, from American, you get more "standard" features and greater load handling flexibility than ever before available in a truck crane! American's big 40-ton capacity 599T is the first machine expressly designed for truck crane operations.

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Typical of American's 599T advanced design features are the revolutionary new swinging outriggers and 5-point blocking system. They provide a stable base for full 360° swings with rated loads—even over the front.

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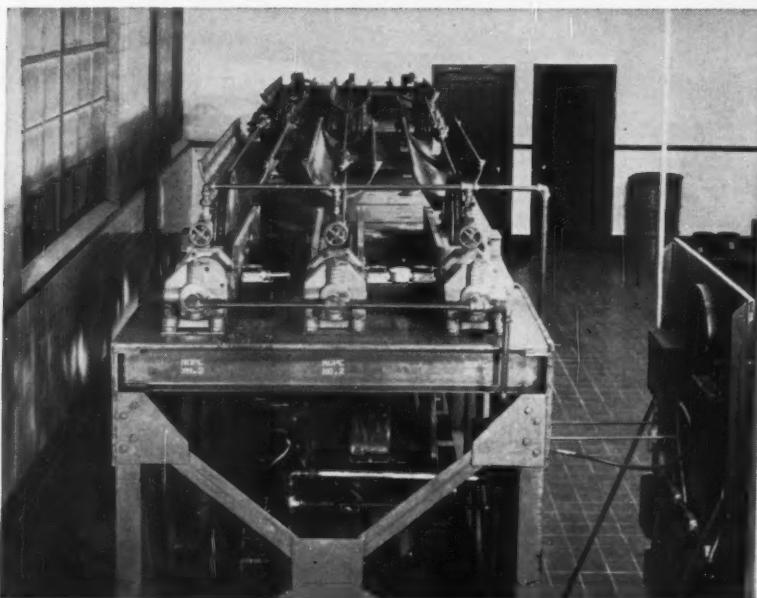
St. Paul 7, Minnesota

AMERICAN HOIST  
PACIFIC COMPANY  
Special materials  
handling equipment

CROSBY-LAUGHLIN  
DIVISION  
Drop forged fittings  
for wire rope-chain



# Tuffy® Wire Rope



## How Union Wire Rope Fatigue Tester Scientifically Predetermines Rope Life

How much service life can you expect from a given wire rope construction? Until recently there was very little factual data to answer that question. Predicting how long a certain wire rope would last under a given set of operating conditions was largely a matter of guesswork, trial-and-error and generally inexact calculations.

Knowing that bending stresses are a major factor in wire rope life, Union Wire Rope engineers designed the Accelerated Fatigue Tester, shown above, to pin down the effects of bending. Now, from a long series of bending tests, scientific data has been accumulated and organized to take the place of former rule-of-thumb methods.

### "Preview" of Service Life You Can Expect

The data established by this laboratory research is based on the effects of various sheave diameters on bending stresses of various constructions of wire rope.

From test data, bending life curves have been plotted by Union Wire Rope Engineers for each of the more widely used rope constructions. Analysis of each of these curves showed them to follow a pattern expressed by the curve shown in Fig. 1 at right, above.

Note on Fig. 1 the curve shows that as the ratio of tread diameter to rope diameter increases (see D/d figures at bottom of chart) the longer the relative service life as expressed by the figures at the left of the chart.

However, there are few pieces of equipment on which sheave and drum sizes can be large enough to afford D/d ratios above 50. From test data the general-purpose range of D/d ratios was determined. Those recommended are set up in Table 3.

Spotted on the curve, for example, is the D/d ratio of 24 at point 2 and D/d ratio of 36 at point 1—these being the range for general purposes taken from Table 3 for the 6x25 filler rope. Moving from these points to the left on the

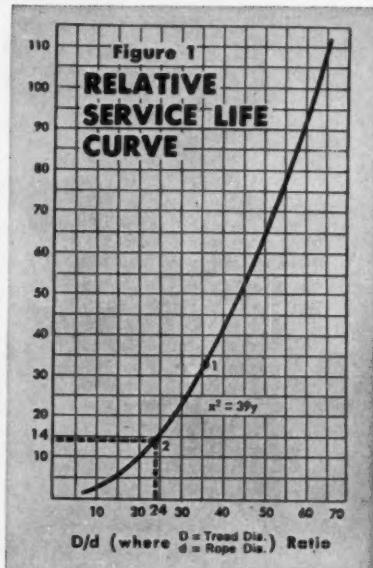


Table 2	
BENDING-LIFE FACTORS	
When Using Curve of 6x25 FW	
CONSTRUCTION	FACTOR
6x7	0.57
18x7	0.67
6x17 Seale	0.73
6x19 Seale	0.80
6x21 Filler Wire	0.92
6x25 Filler Wire	1.00
6x31	1.00
8x19 Seale	1.14
6x37	1.33
8x19 Warrington	1.33
Tiller Rope	2.00

ROPE CONSTRUCTION	GENERAL PURPOSE RANGE D/d Ratios	SHEAVE DIAMETER FACTORS	
		Where $D = \text{Tread Dia.}$ $d = \text{Rope Dia.}$	
6x7	63	42	
18x7	54	36	
6x17 Seale	49	33	
6x19 Seale	45	30	
6x21 Filler Wire	39	26	
6x25 Filler Wire	36	24	
6x31	33	22	
8x19 Seale	31	21	
6x37	27	18	
8x19 Warrington	27	18	
Tiller Rope	18	12	

chart, the relative service life of this rope ranges from 14 to 34 units of any service measure used, such as yards, tons, days, etc.

# Tips

Now to determine the relative service life of say a 6x37. Its bending life factor (see Table 2) is 1.33 as compared to 1.00 for the 6x25 filler wire. Multiply the service life readings of 14 and 25 for the 6x25 filler wire by 1.33, and we find the service life range of the 6x37 falls at 18 and 27 units of service. Relative service life of other ropes are determined in the same way by using the bending factor indicated for each as the multiplier.

Of course bending is not the only wear factor in wire rope operation. Hence the general rule—that more flexible ropes should be used as bending stress increases with decrease in diameter of sheave or drum—has to be modified in field use. Other principal operating conditions—in addition to bending stresses—that affect wire rope service life are loading conditions, portability, corrosion, abrasion, rope speeds, materials handled, and equipment design. You can get further information on all wear factors from your Union Wire Rope distributor or the Union Wire Rope Corporation engineering staff.

## Ordering is ABC-Simple!

No complicated codes or long list of specifications. Just say "Tuffy", give type (Scraper Rope, Dozer Rope, etc.), length wanted and size. Just that easy!

## Good Man to Know: Your Nearby Union Wire Rope Distributor

Whether your wire rope need is a scheduled replacement or a red-hot emergency, your Union Wire Rope distributor is ready with "right-now" service. He keeps varied stocks of Union standard constructions and the Tuffy Special Purpose Ropes. And he's backed by quick service from his nearby Union Wire Rope depot.

If it isn't rope you need, but advice on a wire rope problem, he's just as ready to help. If you don't know your Union Wire Rope distributor already, look under "Wire Ropes" or "Slings" in your telephone directory yellow pages.

Excessive strength can make a rope "muscle-bound"...  
Wire Rope must be

# BALANCED



Buying wire rope on the basis of strength alone leaves other important properties out of consideration. Wire rope, like athletes, can be "muscle-bound" with too much strength.

Strength is not always the answer to the question of the proper rope to use. Strength does not increase flexibility, resistance to crushing, abrasive or fatigue-resistant qualities. Strength does not compensate for the core crushing which accompanies excessive loading.

The Tuffy ropes are engineered for each end-use of the different types of rope. The combination of strength, toughness and flexibility is different for each application. The way to be sure your rope is BALANCED for its job is to use Union Wire Rope. Get in touch with your Union distributor.

## Tuffy Special Purpose Ropes: tailored and BALANCED for special uses



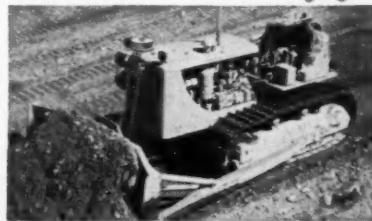
### Tuffy BALANCED Slings & Hoist Lines

Top-performing team in every type of materials handling. Tuffy Slings are made of a patented, machine-braided fabric; stays extra flexible, can't be seriously hurt by knotting or kinking. Tuffy Hoist Line is a special construction of super flexibility and toughness.



### Tuffy BALANCED Scraper Rope

It's flexible enough to withstand sharp bends, yet stiff enough to resist looping and kinking when slack. Moves more yardage per foot because it's specially built and balanced to take the beating of drum-crushing abuse.



### Tuffy BALANCED Dozer Rope

Built to give you longer service with less downtime. 150' reels of 1/2" or 9/16" mounted on your dozers allow you to cut off worn sections without wasting good rope. Put Tuffy Dozer Rope on the job and watch costs go down!



### Tuffy BALANCED Dragline Rope

Made to give you maximum abrasive resistance with super flexibility. Rides smoothly on grooves; hugs the drum when casting for full load. Consistently dependable in handling any material—wet or dry dirt, sand, gravel, rock, cement or minerals.



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## **GMC—America's Ablest Trucks**

## Basic Facts About Diesel Fuels

**JUST WHAT** is diesel fuel? What properties should the best grades possess? Does the color of fuel mean anything? These questions about diesel fuels are among those asked most frequently of field engineers of the Standard Oil Co. of Ohio. Sohio's answers to these and other important questions—presented in non-technical language—follow:

### What Is Diesel Fuel?

Diesel fuel comes from the part of crude oil that evaporates less quickly than gasoline but more quickly than lubricating oils. Crude oil consists of hundreds of compounds, called hydrocarbons, which are "boiled off" the crude at various temperatures. At about 90 deg gasoline begins to boil from crude; at about 600 deg lubricating oil begins to accumulate. Between these two extremes are found the distillates—furnace oil, kerosenes, and diesel fuels—which begin to boil off at approximately 300 deg.

### What Does the Color Indicate?

Nothing. At one time color was a fair indication of the quality of a diesel fuel, but advances in refining have made color a completely irrelevant factor today, except for showing up unusual and obvious cases of contamination. The old test of rubbing fuel between thumb and forefinger to determine its viscosity also has no value today.

### What Does Smokey Exhaust Indicate?

If diesel fuel is of high quality and of the type recommended by the engine manufacturer, smoke from a diesel exhaust must indicate some type of misadjustment. A great deal can be learned from the color of the smoke: Blue smoke indicates that lubricating oil is being burned; white smoke means that the engine is operating at too low a temperature; black smoke, most visible at full throttle, indicates that there is not enough air present to support complete combustion (it's time to check air filters).

### What Are "High Speed" Engines?

Fuel suppliers and engine manufacturers type engines according to the following operating speeds: low speed, 100-500 rpm; medium speed, 500-1,000 rpm; and high speed, above 1,000 rpm. Diesel engines in trucks, earthmoving equipment, and in all but the largest stationary power plants operate at speeds in excess of 1,000 rpm and therefore are considered to be "high speed."

### Must Fuel Have High "Lubricity?"

It is true that to some small degree the fuel tends to lubricate the injectors. But cleanliness is a much more important quality because most injector prob-

lems are caused by dirt or water. Under no circumstances should motor oil be added to diesel fuel. Diesel fuel must fall within a minimum and maximum viscosity range. If it is too viscous, it will not atomize properly as it is sprayed into the combustion chamber, and this means that the fuel will not burn completely. If the proper fuel is used, there is no need to add a lubricant.

### Should Anti-Freeze be Added?

No. Anti-freeze tends to disperse water throughout diesel fuel. This can easily build up rust on check valves, springs, plungers, and bushings in the injectors. In a short time, rust can lead to scoring of these parts.

### Who Establishes Diesel Fuel Specs?

Detailed specifications are established by the American Society for Testing Materials (ASTM). This organization provides, as far as is reasonably possible, objective standards for many industrial products and materials, including diesel fuels. For most purposes, the ASTM recognizes two grades of diesel fuel—grade 1-D, a highly volatile fuel that is preferred for intermittent loads and speeds; and grade 2-D, which is preferred for high-load, sustained-speed operation. Another type, grade 4-D, is a very heavy fuel used only for large, slow speed, stationary engines. While ASTM specifications serve as a model, these are sometimes revised by engine manufacturers.

### What Properties Do Good Fuels Have?

**Cleanliness**—Because the diesel engine injection system is a precision instrument, diesel fuel must be free from dirt, water, and other contaminants. In a relatively short time, dirt and water will score or rust check valves, springs, plungers, and bushings in the injectors.

**Low sulfur content**—All fuels contain varying amounts of sulfur. In some forms it is inactive and harmless, but in other forms it can contribute to corrosive engine wear. For grade 1-D fuel, the sulfur content should not exceed 0.5%; for grade 2-D fuel, it should be below 1%.

**Proper pour point**—The pour point indicates the fuel's ability to flow through the fuel system at low temperatures. The pour point should be low enough so that fuel will flow properly at the lowest ambient temperatures expected during the engine's operation.

**Volatility**—The ability to change from liquid to vapor is called volatility. Because diesel fuels burn only in a vaporized state, volatility influences combustion and is responsible for the amounts of smoke, odor, and harmful deposits that an engine develops.

**Ignition quality**—The cetane number is a yardstick of how quickly a diesel fuel will ignite after it is

*continued on next page*



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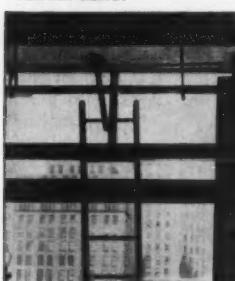
Harrington Electric Co.—electrical contractors—Installed floor conduits, ceiling lights, etc., using both **SHURE-SET** and **RAMSET**.



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## MAINTENANCE SHOP... continued

injected into the combustion chamber. Fuels with high cetane numbers ignite quickly, which means that the engine starts easily and runs smoothly. ASTM recommends a minimum cetane number of 40, except for applications under certain weather conditions when a higher cetane number may be desirable.

### How Should Diesel Fuels be Stored?

Because the diesel injection system is susceptible to rust and scoring, great care must be exercised to keep fuel as clean as it is when delivered from the refinery. It is a dangerous practice to pump storage tanks completely dry because water and sediment settle to the bottom. When new fuel is pumped into the tank, it stirs up sediment. For this reason, fuel should not be used immediately after it is delivered; it should be allowed to stand in storage for at least 24 hr. Care should be taken to see that storage tanks are tightly sealed.

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### The Editor

### Construction Methods and Equipment

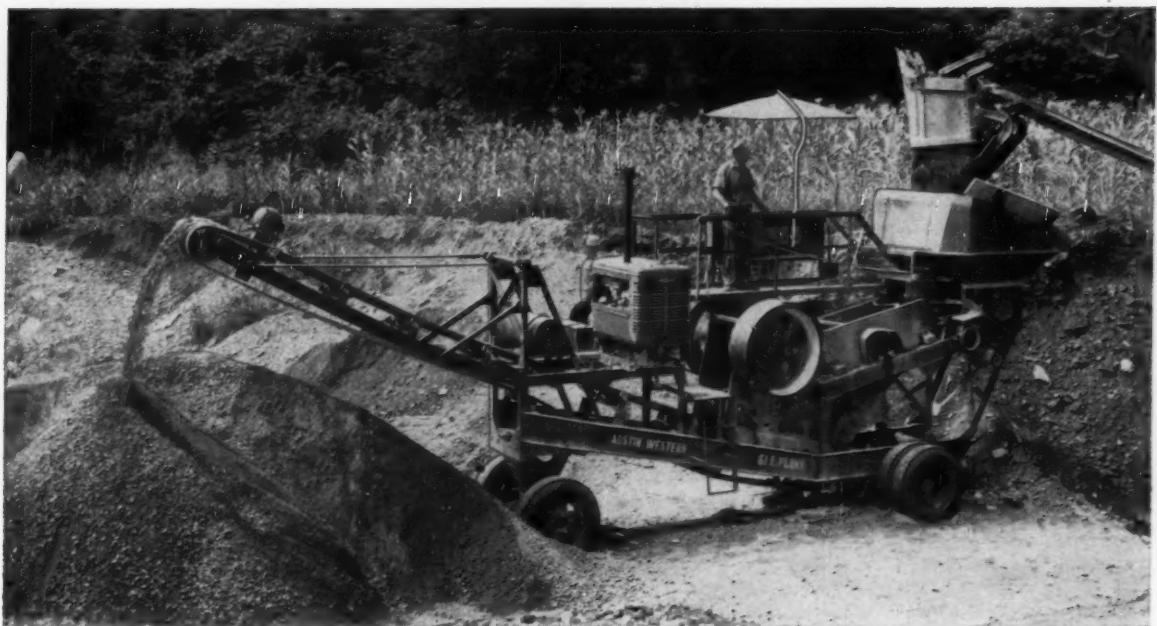
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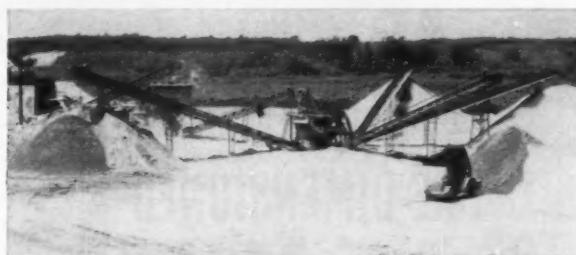
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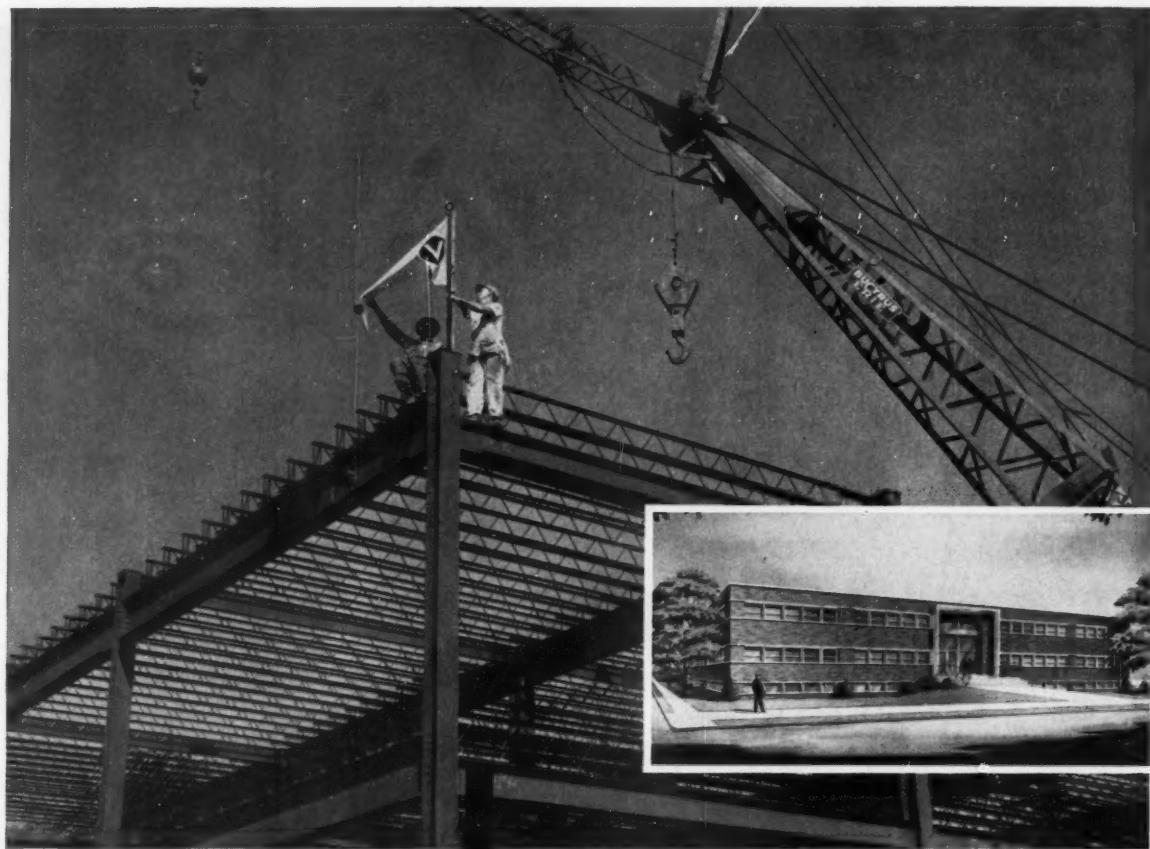
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## Methods Memo . . .



### White Collar Operator

Here's the best dressed crane operator in the business. He's Harry Seaman, known to his fellow workers as "Kid Debonair."

Seaman works for the Lehigh Structural Steel Co. of New York City. At the moment he is setting steel for a new Prudential Insurance Co. building in Newark, N.J.

For him, it's strictly a white collar job. He works in a business suit, white shirt with French cuffs, and a natty bow tie. "As long as I find I can do my job wearing business clothes," Seaman says, "I see no reason to come to work in overalls."

His "office," the cab of a Manitowoc 3000 crane, is just as dressed up as he is. The interior is enamelled white, and the cab boasts "wall-to-wall" carpeting, a hot air heater, and a wash basin.

Who does the dirty work? Why, Al Felsher, Seaman's oiler. "Getting dirty is my job," Felsher says, "Harry's very particular about his crane so I try to keep him happy." Al wears overalls to work.

### TV Performer

An asphalt plant was the star of a Los Angeles TV show. The weekly, 30-min show, "Success Story," featured a Standard Steel 4,000-lb plant owned by Industrial Asphalt of Los Angeles in a description of the part asphalt paving plays in the nation's road-building program.

Four TV cameras maneuvered around the plant to show viewers the manufacturing process in detail. Sponsor of the show was Richfield Oil Co.

### Airborne Maintenance

Army Engineers have developed an airborne maintenance shop that can be dropped from a plane into inaccessible areas.

The unit is mounted on a standard Army  $\frac{3}{4}$ -ton truck chassis. The shop body looks a lot like those used by telephone wire crews. It carries oxyacetylene cutting and welding equipment and a complete assortment of hand tools.

One unique feature is a power package unit consisting of a combination welding and power generating unit capable of producing 7 kw of three-phase electric power and 200 amps of arc welding current. The generator also can operate as a motor driven welding unit with power take-off from the truck engine or with commercial power.

A telescoping cover provides over-head protection for personnel when closed and slides forward to permit loading material in the rear of the truck. The unit weighs 9,000 lb.

### Underwater Eye

The Tennessee Valley Authority has a new way to examine underwater structures for erosion, cracks, and other defects.

In the past such examinations were made by helmeted divers. Visibility often was poor, and sometimes it was difficult for engineers to determine the exact condition of the underwater structure from the diver's report.

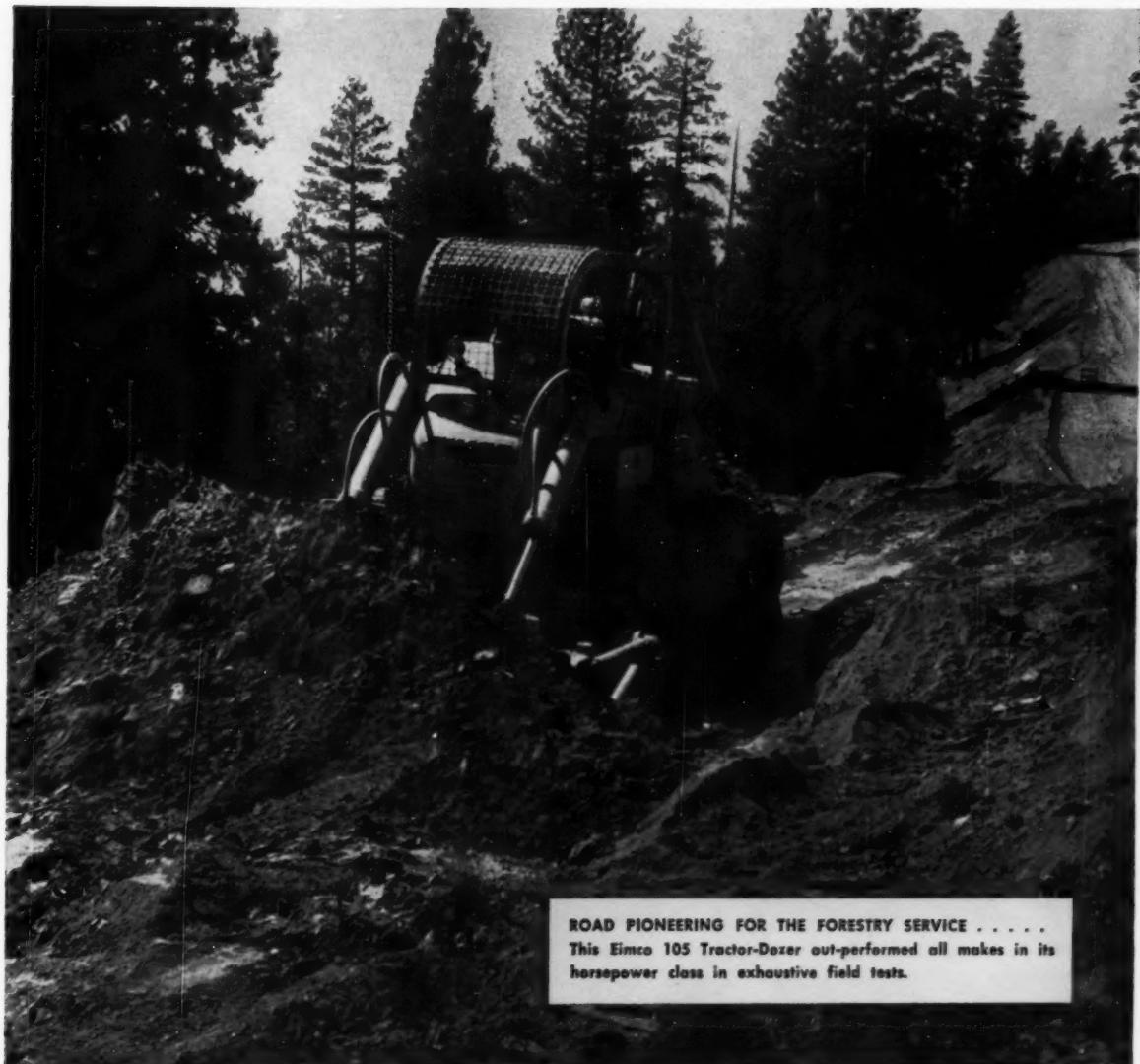
The new system makes use of an underwater closed circuit television camera with special lighting. A diver takes the camera down, and engineers can see the underwater structure clearly on a monitor screen located on land or on a barge.

TVA officials examined underwater construction at Wheeler Dam near Sheffield, Ala., by this underwater television method. They reported erosion cracks, pitting, and individual pebbles in the concrete aggregate were clearly visible even though some of the tests were conducted from a barge during heavy rain and adverse wind conditions. The television equipment was supplied and operated by Bludworth Marine of Clifton, N.J.

### Topping Out in Texas

In Texas, as you know, they do things in a big way. That's certainly true of the Southland Center Building in Dallas, the tallest building west of the Mississippi River.

American Bridge Division of U.S. Steel topped out the 42-story building on New Year's Eve. It was an unusual ceremony. The final piece of the more than 16,000 tons of steel framing was bolted into place some 550 ft above street level exactly two years after groundbreaking. High-tensile steel bolts were gilded for the occasion. And they were delivered to American Bridge steelmen by helicopter.



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